Southern FLIGHT

Including MODERN AIRPORTS

NOVEMBER 1950

35 cents

THE LIBRARY OF CONGRESS
SERIAL RECORD
NOV 21 1950
COPY

MARTIN XB-51 GROUND SUPPORT BOMBERS

½ YARD TO Touchdown!

The first team is coming in . . . via Fairchild Packet . . . and the Airborne Trooper is headed for a touchdown in the drop zone.

He is carrying the ball now in an assault play that is the culmination of the most carefully planned teamwork imaginable.

For behind this hard-driving trooper are thousands of hours of training and practice and co-ordination with countless other well-trained experts: pilots, plane crews, ground technicians and a host of other U. S. Air Force and U. S. Army strategists and tacticians.

Tracing the team members back even further than that, there are the engineers and designers who planned and created Fairchild's C-82 and its larger, more powerful sister ship, the C-119 ...transports that bring the Trooper to his goal.

Together, they make a winning combination ... resulting in successful touchdown after touchdown . . . in the Air Age.

ENGINE AND AIRPLANE CORPORATION

FAIRCHILD *Aircraft Division*

HAGERSTOWN, MARYLAND

Other Divisions: Fairchild-NEPA Division, Oak Ridge, Tenn. • **Fairchild Engine Division, Guided Missiles Division, Al-Fin Division** and **Stratos Corporation,** Farmingdale, N. Y.

Put RUSTON on your FLIGHT PLAN

You can always depend on a smiling welcome from veteran flyer S. L. Stuckey, pictured at left, manager of the Municipal Airport at Ruston, Louisiana. The airport has a hard surface runway and top-flite Mobilgas Aircraft and Mobiloil Aero Service at your command. Stuckey's Flying Service has excellent maintenance and hangar facilities and there's a comfortable ready-room and lounge while you're waiting—or quick transportation into the city if you desire.

Mobilgas AIRCRAFT

FORWARD WITH Aviation

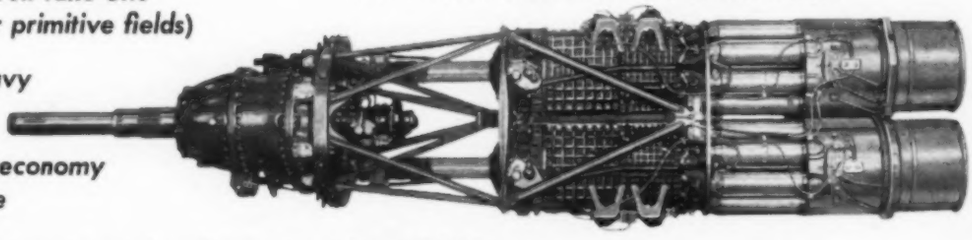
Mobiloil AERO

MAGNOLIA PETROLEUM COMPANY

ALLISON TURBO-PROP ENGINE GIVES NEW STRIKING POWER TO NAVY BOMBER!

- **SUPER POWER** *for short-run take-offs (from smallest carriers or primitive fields)*
- **SUPER POWER** *to lift heavy bomb and rocket loads*
- **SUPER POWER** *with fuel economy for broader striking range*

T40 • 5500 HORSEPOWER • 2500 LBS. WEIGHT



- **SUPER POWER** *from twin-power sections for twin-engine reliability*

DEVELOPING 5500 horsepower—more than most four-engine bombers of World War II—the Navy-sponsored Allison T40 Twin Turbo-Prop engine makes the Douglas XA2D Skyshark one of America's most versatile fighting planes.

The twin-engine sections—their compact design providing single-engine aircraft with twin-engine reliability—drive contra-rotating Aeroproducts propellers through short shafting and a reduction gear.

For cruising, one power section may be cut entirely. The remaining section, operating at its maximum efficiency, continues to drive both propellers—thus enabling the most economical use of fuel which broadens the aircraft range.

By the combination of these turbine engine features in a great new airplane, our Armed Services are provided with an advanced versatile weapon for combat wherever needed.

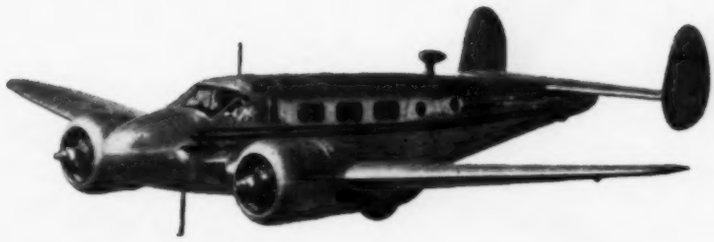
Allison

DIVISION OF GENERAL MOTORS, INDIANAPOLIS, IND.

GM GENERAL MOTORS

Builders of the famous J33 and J35 Turbo-Jet Aircraft Engines

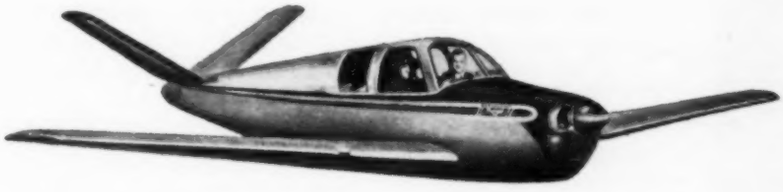
Unquestioned Dependability



Dependability in flight depends on perfect functioning of engines, instruments, radio, electrical system, hydraulic equipment and many other items too numerous to mention. But your aircraft in flight can only be expected to perform in keeping with the quality of the attention it has received on the ground.

- The J. D. Reed Company makes a major investment in the members of its staff for intensive training at the various factories in addition to years of specialized engineering and maintenance experience.

- You pay no more for this technical know-how, but you receive countless hours of enjoyable trouble-free flying with confidence in the **unquestioned dependability** of your aircraft in flight through the unfaltering high standards of the J. D. Reed Company.



J. D. REED CO., Inc.
SALES SERVICE
Beechcraft
DISTRIBUTOR
MUNICIPAL AIRPORT
HOUSTON, TEXAS

A Look Ahead! Martin Turbo 4-0-4s will

set new airline standards of comfort, speed and reliability. Advanced studies indicate that the Allison T-38 Turbo-Prop engine will provide smooth, vibration-free power with unusually small specific fuel consumption.

A Look Ahead! tomorrow's turbo-props will use Phillips 66 Fuels!

The new Allison T-40 Turbo-Prop engine is rated at 5500 horsepower. Yet this remarkably compact engine weighs only 2500 pounds, and measures but 25 inches by 39 inches frontal area.

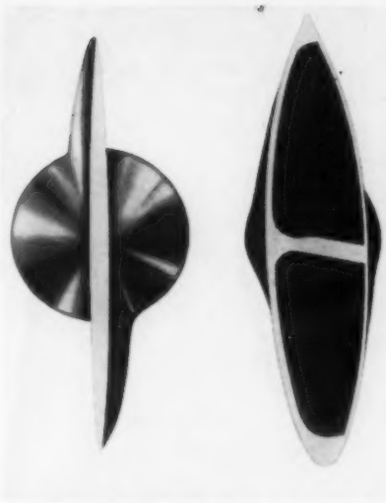
CONTINUED research on high octane gasoline, jet fuels and special purpose aviation fuels has long had a high priority in Phillips laboratories.

Our aviation manufacturing facilities have already met exacting military specifications for considerable quantities of new jet fuels. That is why we *know* we are ready for the coming jet and turbo-prop era in American commercial aviation.

When you want dependable aviation products for today's piston engines or tomorrow's turbo-props, think first of Phillips. The Aviation Department, Phillips Petroleum Company, Bartlesville, Oklahoma.

Phillips 66

AVIATION PRODUCTS



SUPERSONIC PROPELLERS designed by Aeroproducts Division of General Motors have been under development for several years. This illustration shows very thin chord section of supersonic blade at left in comparison with section of conventional subsonic blade at right. Both sections are at a station 20 ins. from the butt end of the blades. Aeroproducts will start operating world's first supersonic propeller spin pit early in 1951 to test thin blades, evacuating 99 per cent of the air from the pit's chamber so that a 450-hp. engine can rotate the propeller at very high rpm.
—(Aeroproducts Picture.)

AIR Report
Significant Trends and News

SECURITY CONTROL will be first phase of ADAC plan for mobilization of civil air power, with CAA soon to announce establishment of identification card system for pilots. Cards issued by CAA will provide assurance of internal security based on acceptable proof of positive identification, place and date of birth, citizenship and a loyalty pledge. A similar card system for ground personnel will be established. Pilots will be encouraged to (1) obtain prompt physical check-ups so licenses will remain valid, (2) obtain FCC licenses permitting use of aircraft transmitters, (3) acquire proficiency in navigation, meteorology and cross-country flying to facilitate compliance with security rules and emergency uses.

NO INTERRUPTION IN NAVION PRODUCTION FOR SIX MONTHS is expected, although Ryan Aeronautical Co. has announced it will temporarily suspend Navion production next year so that all facilities can be devoted to military needs. Reinstatement of civilian Navion production at the earliest feasible date consistent with military commitments was promised by T. Claude Ryan, who said the suspension, although only temporary, means "sacrifices to us and our Navion sales organization."

PRIORITIES FOR AIR TRANSPORT PARTS AND SUPPLIES are expected, their essentiality being obvious for continued operations in an emergency. Efforts are also being made to obtain recognition of essentiality of parts and supplies for non-scheduled aircraft including executive, private and industrial planes which will also require priorities in an emergency.

INCREASED EFFICIENCY FOR SMALL TURBINES is being attained with supersonic compressors, which may offer best bet yet for reducing fuel consumption. Most advanced work in this line has been done by Frederic Flader.

CIVIL AVIATION MOBILIZATION is being charted by a general committee and five task groups established by NSRB Chairman W. Stuart Symington, with CAB Chairman Del Rentzel heading up the undertaking. He is setting up an "Air Transport Mobilization Survey," which will cover scheduled and non-scheduled air transport; training, overhaul and maintenance performed by fixed-base operators, airlines and manufacturers; private flying performed by individuals and groups; airports, and airways. Task group chairmen are as follows: (1) Air transport, Milton W. Arnold, vice president of Air Transport Association; (2) training, overhaul and maintenance, W. J. Graham, Pittsburgh, Butler Airport; (3) private flying, George E. Haddaway, SOUTHERN FLIGHT editor and publisher; (4) airports, A. B. Curry, Miami International Airport, and (5) airways, G. A. O'Reilly, Aeronautical Radio, Inc.

RESEARCH CROP PLANE AT TEXAS A. & M. WILL FLY THIS MONTH, according to present schedule. The low-wing, single-seat, all-metal, Continental-powered craft will

(Continued on page 32)

Southern FLIGHT including MODERN AIRPORTS

NOVEMBER, 1950 VOL. 34, No. 5

COVER shows two experimental USAF Martin XB-51 ground support bombers making a low pass over the Glenn L. Martin runway at Baltimore, Md. This model has three jet engines of over 5,200 lbs. thrust each (one in empennage), variable incidence wings of 55-ft. span which are swept back 35 degrees, and horizontal stabilizer mounted atop the vertical fin. Two-man crew operates the big craft, being pilot and radio-operator-navigator. Performance details have not been released.
—(Glenn L. Martin Photo.)

Air Report—SIGNIFICANT TRENDS AND NEWS - - - - - - - - 7
Just Among Ourselves—EDITORIALS - - - - - - - - - - 9
Flying the Anderson-Greenwood Pusher—
BY GEORGE E. HADDAWAY - - - - - - - - - - - - - 14
11-Pl. Bell Helicopter—
FIRST PHOTO DETAILS OF NEW USAF TRANSPORT 'COPTER - - - 17
Supersonic Propellers—SPECTACULAR PROGRESS FOR TURBO-PROPS 18
Autopilot for Lightplanes—BY TOM ASHLEY - - - - - - - - 20
Veteran Air Pilots—BIOGRAPHIES—BY JIM WHEELER - - - - - 26
Gathering of the Clan—
AIRPORT AUTHORITIES ASSEMBLE AT CONFERENCES - - - - - 28
Feeder Facts and Figures - - - - - - - - - - - - - - 32
Airmen's Calendar—COMING EVENTS - - - - - - - - - - 33
Questions and Answers for Airport Operators - - - - - - - 34

GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; E. H. PICKERING, Research; L. M. ROBERTSON, Circulation Manager.

SOUTHERN FLIGHT, November, 1950. Vol. 34, No. 5. Published monthly. Publication office, P. O. Box 750 (1901 McKinney Ave.), Dallas 1, Texas. Price 35c single copy. Subscription rates: United States, one year $3.00; two years, $4.00; three years, $5.00. Established February, 1934. Entered as second-class matter at the Post Office, Dallas, under the act of March 3, 1879. Copyright, 1950, by Air Review Publishing Corporation.

Larry Hart KNOWS SUPERIOR RADIO WORK...

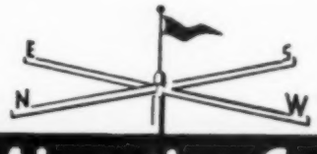
Larry Hart sets the course selector on his ARC type 15B omni-receiver. Note the convenient location of the omni range control unit...close to the pilot's left hand.

L. A. (Larry) Hart is one of the Southwest's best-known and most successful young executives. Hart pilots his own Bonanza airplane which keeps him in close contact with his varied business interests. Here is what he has to say about the job performed by Southwest Airmotive in revamping his plane's radio system.

"The old equipment in my Bonanza was both unreliable and difficult to maintain. Southwest Airmotive analyzed my needs, removed some of my old gear, reworked some of the other, and added an ARC omni-receiver. The system now functions smoothly and safely. Incidentally, I am especially pleased with the fact that ARC gives a full year guarantee on all its new products. As a businessman, I consider this factor an important one in making an aircraft radio purchase."

L. A. HART

HART'S EXPERIENCE IS *your* EXPERIENCE AT—



Representing ARC and RCA

Southwest Airmotive Co.

CAA Approved Repair Station No. 195 | LOVE FIELD, DALLAS

Just among ourselves

EDITORIALS

PRODUCTION OR PARALYSIS?

JUST how essential is the modern fleet of executive, industrial and agricultural aircraft now doing yeoman service all over the nation? Even now, in a state of partial mobilization, critical shortages are beginning to show up which threaten to curtail not only the production of personal and executive aircraft but also to jeopardize uninterrupted operation of the fleet-in-being. Ryan has announced the temporary suspension of Navion production in order to go all-out on military contract production, right at a time when the market for this type of airplane is picking up. This piece of news certainly is a loud warning signal of possibly more serious developments.

Barring conditions that force total mobilization, it would be a terrible tragedy to stop the manufacture and sale of personal planes. American business and industry will need them for transportation and other specialized uses more than ever before as the mobilization program gains momentum. And while all measures must be taken which will insure the perpetuation of our civilian aircraft industry, we must simultaneously see to it that present owners and operators of aircraft be given adequate priorities for the uninterrupted use of their equipment.

The first step is to establish the essentiality of all civil aircraft manufacturers and the essentiality of executive, charter, industrial and agricultural airplane utilization which has been integrated into the U. S. business economy as completely as trucks, box cars, machine tools or plows. After this essentiality has been proved, and assuming the powers that be provide adequate priority, we've solved only one part of the problem. A priority is no good if materials and parts are not available. We went all through that in the last war. This time critical shortages must be nipped in the bud when they first begin to show up. For example, one of the scarce items insofar as civil aircraft are concerned is crankshaft steel for engines. This one material alone can shut off factory production of civil aircraft and ground many units of the fleet-in-being during the first year of the short supply. The seriousness of the problem is obvious.

Fortunately, the National Security Resources Board recently formed an Air Transport Task Group to undertake immediate studies looking toward final mobilization plans for all phases of civil aviation. If the essentiality of non-airline aviation can be established on the same basis as scheduled airline aviation is certain to experience, the battle can be won. Anything short of that basis just won't cut the mustard. The final outcome will depend largely on the spade work during the next couple of months on the part of owners, operators, manufacturers, trade associations and others who are vitally concerned with the preservation of the civil aircraft industry and the complete utilization of all essential civil aircraft no matter what crises develop under the gathering war clouds.

LESSONS FROM KOREA

LIEUTENANT General George E. Stratemeyer has wisely pointed out that the Korean War can easily lead to false conclusions if we use it as a pattern for future air-war planning. Observing that our successes in Korea came about largely because the Communists had no air force worthy of the name, Stratemeyer emphasized the fact that the ground forces could not continue to expect the amount of air support they enjoyed in Korea, where the fighter pilots actually complained they consistently ran out of targets.

The Stratemeyer warning is an important and timely one and should be heeded.

Air superiority was seized handily and at the outset from the North Koreans because they had few airplanes and those were of inferior types. It would have been a far different story if the North Koreans had initiated their aggression with an effective air force. With air power the Communists could have bombed U. S. and U. N. ships and harbors, interfered with our air and surface supply lines and bombed and strafed our troops.

But the Communists attacked without an effective air force and their ground troops suffered tremendous odds as U. S. and U. N. air power hammered them from the battle fronts rearward through supply lines and far back into strategic supply sources. Fighter and bomber pilots exhausted their targets, so heavily was U. S. and U. N. air power thrown into the conflict. Along the Pusan perimeter, this application was so thorough that three fighter sorties were flown per day per mile, crowding the air with planes.

It is a "wrong conclusion" to view this as meaning that our ground forces in any future war could continue to rely on such heavy air support, says General Stratemeyer. Against aggressive enemy air power we couldn't provide such support on a similar scale. As in the past, our greatest weapon against aggressive enemy air forces is long-range strategic air power, capable of searching out and destroying enemy air resources such as homeland factories producing enemy aircraft, engines, accessories and fuel.

What General Stratemeyer means in his timely warning to those who might attempt to influence air-war planning in behalf of battlefield aviation is this: *Don't be deluded into over-emphasizing the battle front as a target for future air power. Against an enemy equipped with aggressive air power, the decisive targets are far to the rear in the enemy's industrial resources which supply that air power.*

(Continued on page 41)

"PACKAGED SERVICES"

for your Beechcraft

thru Factory Certified Service

Service for your Beechcraft at Certified Beechcraft Service Stations consists of many things, all aimed at providing complete satisfaction in your flying.

It means limousine or courtesy car transportation, attention to such details as windshield cleaning and many other extra services which Certified Beechcraft Service Stations take special pride in providing.

Our skilled and efficient Beechcraft factory trained staff, adequate equipment, stock of factory authorized parts and accessories plus economical prices assure the Beechcraft owner of *packaged service* at any of the Certified Beechcraft Service Stations listed.

Aircraftsmen, Inc.
Will Rogers Field
Oklahoma City, Oklahoma

Alamo Aviation, Inc.
Municipal Airport
San Antonio, Texas

Amarillo Aircraft
Tradewind Airport
Amarillo, Texas

Anderson Air Activities
General Mitchell Field
Milwaukee, Wisc.

Truax Field
Madison, Wisc.

Atlantic Aviation Service
New Castle County Airport
Wilmington, Delaware

Atlantic Aviation Corp.
Teterboro Airport
(25 minutes from Times Square)
Teterboro, New Jersey

Butler Co., Aviation Division
Municipal Airport
Chicago, Ill.

Francis Aviation
Capitol City Airport
Lansing, Michigan

Gray Aircraft Svc. Co., Inc.
D. A. Cody, Service Mgr.
Love Field, Dallas, Texas

Harte Flying Service
Municipal Airport
Wichita, Kansas

Ohio Aviation Company
Dayton Municipal Airport
Vandalia, Ohio

J. D. Reed Co., Inc.
Municipal Airport
Houston, Texas

Roscoe Turner Aeronautical Corp.
Municipal Airport
Indianapolis, Ind.

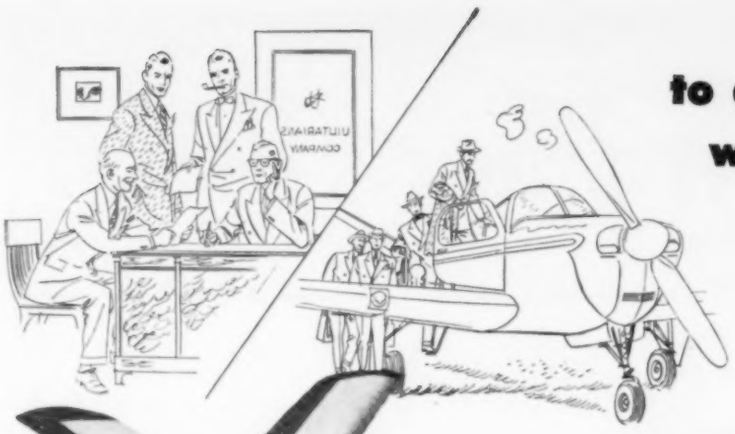
Tulsair Distributors, Inc.
Hangar 5, Municipal Airport
Tulsa, Oklahoma

Wings, Incorporated
Wings Field
Ambler, Pennsylvania

Philadelphia International Airport
Philadelphia, Pennsylvania

Gear your company to a faster selling pace . . . with a company-owned

Beechcraft



There's more time for field work when you cruise there and back at 170 mph. Your executives "take off and go" on their *own* schedule because this completely equipped plane is ready for action — day or night.

"At home" on big city airport or short field alike. New Beechcraft propeller adds to take-off performance. Take-off hp rating increased to 196 at 2450 rpm. Steerable nose-wheel for better maneuverability.

Plenty of room for "sample" cases! Oversize baggage compartment. And it's easy to get at, inside or out. Entrance from cabin is zippered. Want *more* luggage room? Back seat removable in three minutes flat!

Remarkably low operating costs make treasurers happy! Fuel consumption 9.5 gallons per hour. Just 56% of engine's rated horsepower used while cruising. Means fewer engine repairs—an extra safety margin.

No "travel fatigue"—even on long trips. The Bonanza gives you a 750-mile range...and it will be completely *comfortable* travel in the sound-proofed, roomy cabin. Four can ride in stretch-out comfort.

Safety far beyond usual standards. All-metal framework is stronger than conventional construction. In shock and stress tests it far surpassed CAA requirements. Wide, long wheel base is *rugged;* smooths rough landings.

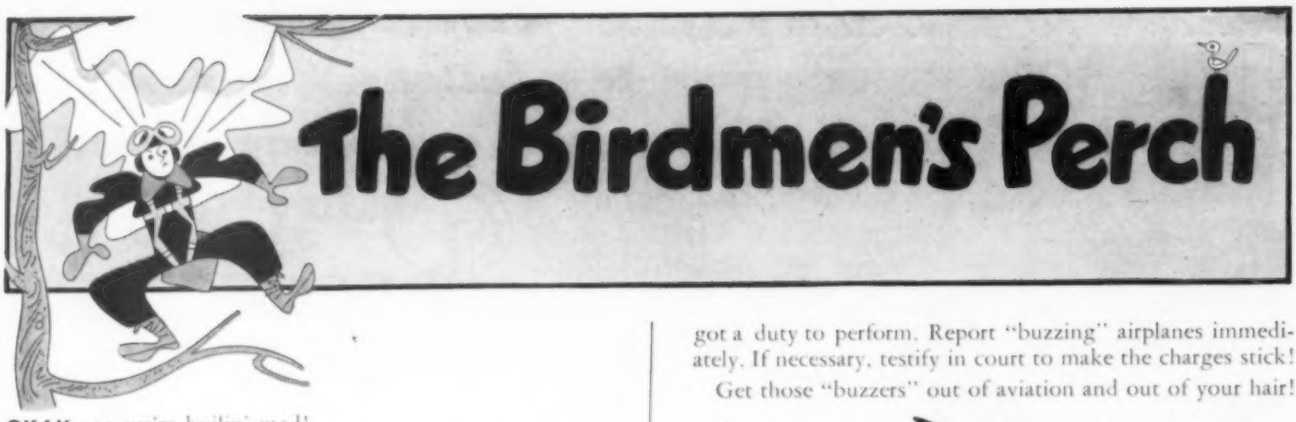
Because it's designed to excel in not just one category but in *all* important ones, the Model B35 Beechcraft Bonanza is the leading seller in its class. Inspect it today at your Beechcraft distributor's or dealer's. Or write for full information on your company letterhead to Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

Top speed, 184 mph
Cruising speed, 170 mph
Range, 750 miles
Fuel economy, 9.5 gph

Beechcraft

BONANZA

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS



OKAY—so we're boilin' mad!

Just read some CAB figures on "buzzing" accidents and they're just too sickening to repeat. All of which makes us

wonder why that super-idiotic category known as "buzz-boys" don't become *Kamikaze* pilots. They'd stand a better chance.

"Buzzing," taking chances at low altitudes, is by all odds the stupidest, most dangerous thing a pilot can do. You not only risk your own life, but the lives of others, your plane, and damage to other property!

In short, the so-called "buzz-boy" is a menace—arch enemy No. 1—to the perpetuation and advancement of aviation and all that it stands for.

As a flyer or aviation enthusiast, you've got a duty to perform. Report "buzzing" airplanes immediately. If necessary, testify in court to make the charges stick!

Get those "buzzers" out of aviation and out of your hair!

TURN ON THE CHAMBER MUSIC, MAC

Ah, there's nothing like a background of stringed instruments when we go into our song and dance about Gulfpride Aviation Oil—Series D!

There just isn't any better way to make an engine sing . . . because Gulfpride Aviation Oil—Series D—is the finest detergent dispersant oil for horizontally opposed engines there is!

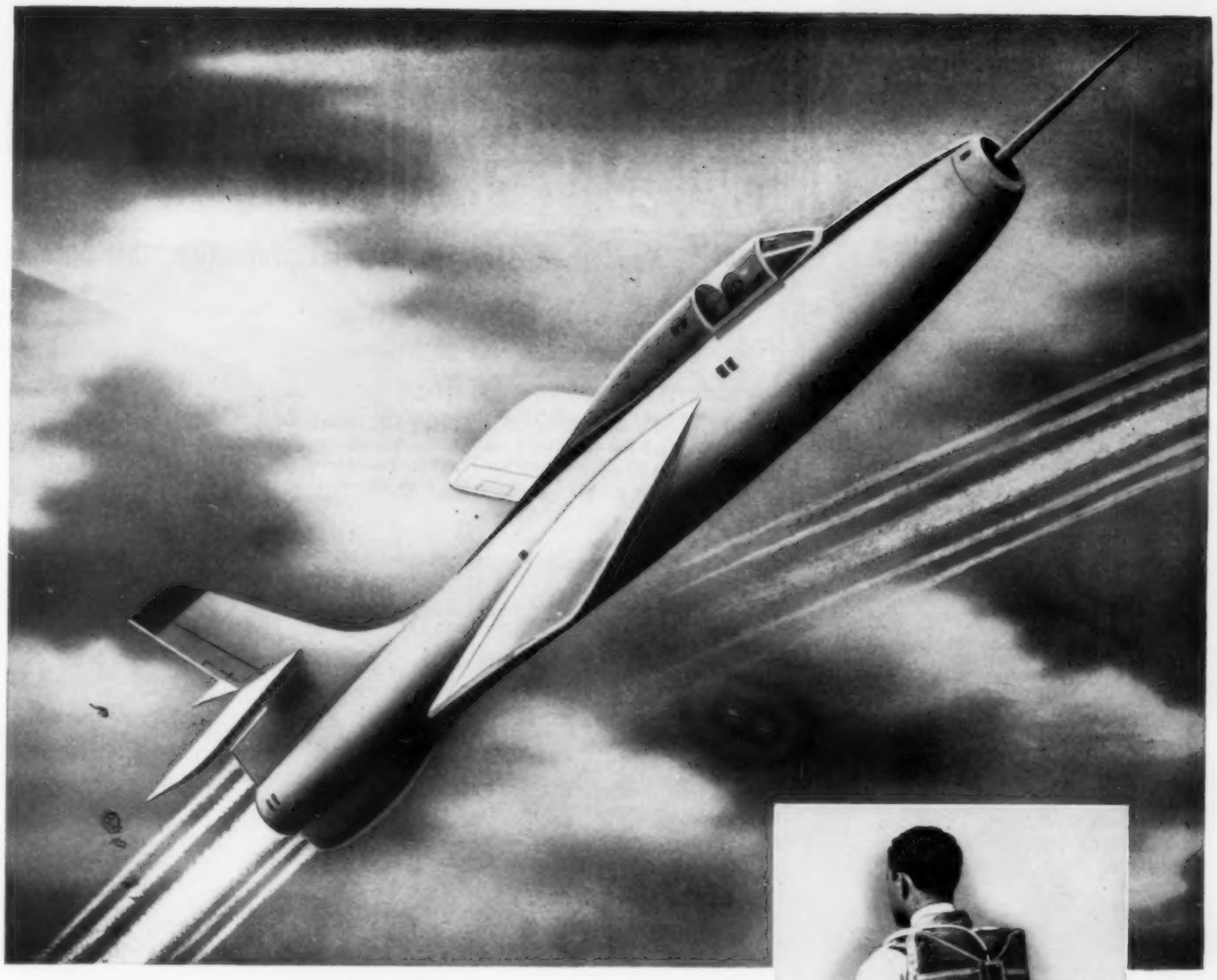
If you want to increase those periods between overhauls up to 100%, use the only aviation oil put through Gulf's exclusive Alchlor process to remove those extra carbon and sludge formers!

That's it, lads, Gulfpride Aviation Oil—Series D (for dandy)! You can't do your engine, or yourself, a more important favor!

GULF

AVIATION PRODUCTS

Gulf Oil Corporation . . . Gulf Refining Company



PIONEER 'CHUTES *Preferred* BY JET PILOTS

Where split-second timing and performance count the Pioneer P5-B parachute is the ultimate in design and dependability. Pilots and crewmen of today's jet and super-speed experimental aircraft depend on the P5-B for its proven, positive performance under strain and tensions of modern high-speed flying conditions.

Equipped with Pioneer's Quick-Fit-Harness*, it is given highest rating by the pace-setting aviation industry and is accepted as standard equipment of U.S. Air Forces and many other governments.

All Pioneer parachutes are equipped with the Pioneer Quick-Fit-Harness* which enables the wearer, regardless of size or weight, to adjust the harness to a perfect fit in less than three seconds.

**Patents issued and pending in all principal countries throughout the world.*

Southwest Factory Branch
Love Field
Dallas, Texas

PIONEER PARACHUTE COMPANY, INC.

MANCHESTER, CONNECTICUT, U. S. A.

CABLE ADDRESS: PIPAR, Manchester, Conn., U. S. A. TELEPHONE: Manchester 4157

Flying the Anderson

Now licensed for commercial production, this unconventiona

AG-14 pusher, with 90-hp. Continental, has low-to-ground cabin and exceptional visibility. Cabin floor is only 16 ins. off the ground for easy access. Long, narrow wing has very effective flaps for steep approaches. Twin-boom empennage has horizontal stabilizer mounted high above slipstream.
—(Anderson-Greenwood Aircraft Photos.)

Greenwood Pusher

all-metal 2-place personal airplane proves to be quite a performer in a series of introductory flights

By GEORGE E. HADDAWAY

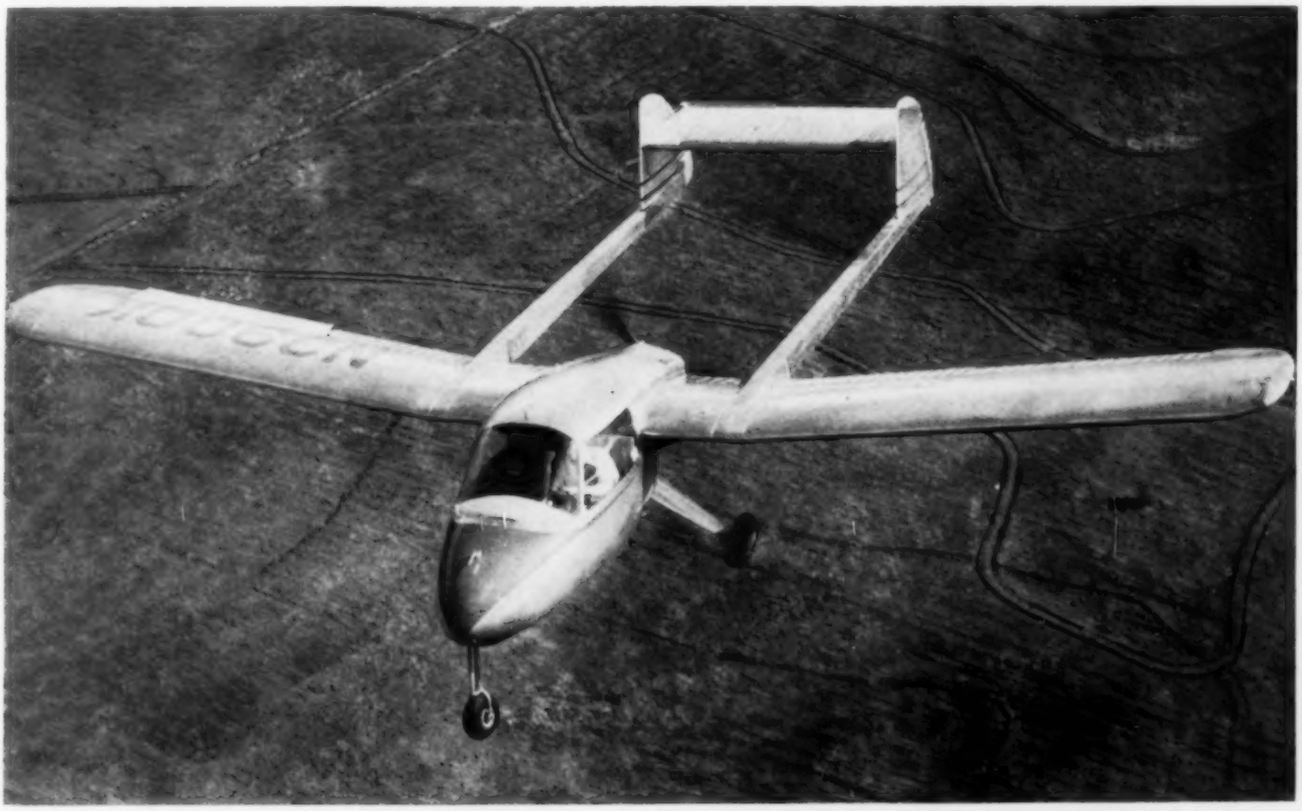
IF it took a brave man to eat the first oyster it required just as much fortitude to design, sweat out and build a two-place pusher during the past couple of transitory and treacherous years in the lightplane world. Anderson, Greenwood & Company of Houston did just that and are now the proud possessors of a CAA Approved Type Certificate.

The 90-hp. all-metal, tricycle gear, twin-boom AG-14 Continental-powered pusher inspires both respect and amazement, largely because many competent engineers gave up long ago on some of the knotty problems surrounding such a design—problems of engine cooling, vibration, balance and wing-body interference. In this case one man's poison turned out to be another man's meat.

Our introduction to the little pusher began during a recent visit to Fred Weick's bailiwick at Texas A. & M. College when Marvin Greenwood flew up from Houston to receive his ATC in person from CAA's Fourth Region Administrator Larry Elliott. Although a longer cross-country flight has been promised, we took advantage of the opportunity to get in a couple of hundred miles and establish a fair speaking acquaintance with the AG-14. Frankly, we were impressed with the remarkable performance, good flight characteristics and unheard of visibility the designers have achieved.

Our first impression was that here were some competent engineers entering the lightplane field—not a group of promoters making outlandish claims and promises they couldn't keep. At one airport we visited, someone asked why they hadn't heard a lot of bragging about the airplane before it was ATC'd—a fair question in a game where non-existent paper airplanes or rank experimental models are usually over-publicized. But Anderson, Greenwood & Company preferred the modest route—get an approved model, then talk about it. The approved AG-14 speaks for itself.

The sun was sinking fast when we decided to take off from commodious



Clean lines of AG-14 are emphasized in this flight shot. Note how pusher engine has been fitted without disturbing air flow around pod cabin. Engine cooling air intakes are beneath wing leading edge just behind doors. They help fillet the wing-body intersection. Span is 34 ft. 7 ins. but narrow wing has area of only 120 sq. ft. Wing loading is 11.7 lbs./sq. ft.
—(Anderson-Greenwood Aircraft Photo.)

A. & M. Airport and go somewhere. Houston was closed on account of low ceiling so we headed west to Austin, some 90 miles away. After the taxi-out, warm-up and mag check, we started down the runway for a brand new experience. We've never been so close to the ground before except under tow in a glider. It was a new and peculiar feeling to go breezing along a few inches off the ground under your own power. The amazing forward visibility, what with the tricycle gear and the horses back of you, served to accentuate the sensation of being on skis, and you actually got the feel of acceleration far more vividly than in conventional craft.

The 14 got up and away handily and at 500 feet in the turn we discovered the extraordinarily small rudder—just enough for good co-ordinated turns. The 14 is basically an aileron airplane.

Wind was cross-head about 7 mph.; yet under full load we made the first leg at an average speed of 111 mph. —not bad for 90 horsepower.

Not having had the benefit of a check ride, the first landing was a bit "hot," since we didn't pull the flaps. Again, all that remarkable forward vision brings the ground up fast. We've been told the 14 has less wing area than a Swift despite its 34-ft. span—in fact the smallest wing area of any ATC'd airplane made today. So you make a comfortable 80-mph. approach and a 50 to 55-mph. touchdown—about the same as the Luscombe. For the novice, we recommend several tutored landings before solo.

The next day we did another leg at approximately the same 111 mph. hour with a mild cross-wind and below 2,000 feet. Wherever the 14 lands you're assured a crowd due to the unorthodox twin booms and pusher arrangement. The airport experts found it difficult to believe the performance we reported.

Following our cross-country, we had the opportunity at Houston's Sam Houston Airport, where the AG-14 is manufactured, of doing additional airwork including power-on and power-off stalls, half-flap take-offs, full- and half-flap landings.

It is impossible to spin the 14 in a power-off stall. The only way to spin the airplane at all is with full power, and then you only get one turn.

The remarkable stability engineered into the 14 is demonstrated effectively by power-on and power-off stalls. In the power-off stall, forward c.g. at gross weight, a slight break and pitch occurs when wheel is full back. After a mild buffet the 14 settles and holds nose-on-horizon position indefinitely.

Spacious baggage compartment behind seat is readily accessible. Cabin is roomiest of any side-by-side 2-pl. airplane, with seat width of 44 ins., and ample head and leg room.
—(Anderson-Greenwood Photo.)

Coordinated turns can be made with wheel full back.

In power-on stalls with wheel full back with aileron and rudder frozen, a slight break occurs. The nose remains at horizon and an interesting lateral rocking develops. The oscillations are about five seconds per cycle and build up to about 30 or 40 degrees of roll, which becomes a stable condition of indefinite duration.

The roll can be controlled immediately by aileron alone and almost completely by rudder alone. Relaxing pressure on the wheel stops the "rocking chair" effect immediately. The constant buffeting during the maneuver is mild.

Flaps are two-position and manually controlled by a direct action flap lever on the floor between pilot and passenger, similar to the Piper Pacer and Stinson designs. The locking control is on the handle and engaged and disengaged by a simple twist. Similar to the effects of flaps on the Navion, you achieve a high degree of safety and literally come down like an elevator on high approaches. Half-flaps provide quicker take-off for short field work, in which the 14 is impressive.

You have to get used to steering the airplane with the wheel on the ground and the rudder in the air, which is one of the handicaps of a conventional pilot in the Ercoupe You must watch out on landings not to try and pick up a wing with the wheel. Single foot-brake pedal just to the right of the right rudder pedal controls both wheels and we'd prefer conventional toe or heel brakes. Also, the starter button, located between the rudder pedals on the floor, should be and probably will be moved to a better location on production models now being assembled.

The designers emphasize that visibility was their major goal. They hold to the thesis that vision is a basic factor in the pure enjoyment of flight, and we're inclined to agree. When the prototype was being test flown, Greenwood said they were doubtful that substantial improvements could be made in speed or load-carrying ability for a small, low-cost, side-by-side, safe and easy-to-fly airplane. But they did feel that definite improvements could be made in developing the small plane into a better and more comfortable observation platform while maintaining highest standards in speed and load carrying ability. This they have achieved and the 14 today exceeds the small-airplane field in the matter of visibility.

Ranking right alongside visibility is the low-to-the-ground cabin and wide doors for easy entrance and comfort. You step right in as you do in your auto—no wing walking, handles or steps needed. The ladies should be especially impressed with this feature.

Cabin comfort (44-inch width) and low noise level through good soundproofing are commendable attributes.

The company has all the basic tooling required for production. Production engineering is still going forward.

The pusher's unconventional structure, particularly the pod cabin, probably means higher production costs then experienced with conventional designs. Right now they believe it can be built and sold profitably for $4,200, but prices for everything are skyrocketing and they are reluctant to establish a firm figure. Their realistic attitude is further exemplified by recognition of market trends in that 4-place airplanes and not 2-place jobs are the big sellers now. But they do feel a definite specialized market exists which might be exploited if mobilization for war doesn't interfere.

The airplane is spin-resistant, provides 3½ hours comfortable range, is

(Continued on page 40)

ANDERSON-GREENWOOD AG-14

Specifications

Span, ft./ins.	**34/7**
Length, ft.	**22**
Gross Weight, lbs.	**1,400**
Empty Weight, lbs.	**850**
Useful Load, lbs.	**550**
Baggage Capacity, lbs.	**80**

Performance

Maximum Speed, mph.	**Over**	**120**
Cruising Speed, mph.	**Over**	**110**
Landing Speed, mph.		**50**
Rate of Climb, fpm.	**Over**	**700**
Ceiling, ft.	**Over**	**19,000**
Range, miles	**Over**	**400**

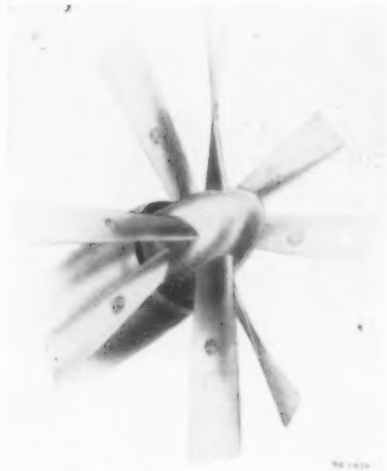
Taken in field trials, photo shows H-12 as a front-line troop carrier. Eight fully-equipped infantrymen can ride inside cabin. Without equipment, cabin carries 10 passengers and pilot.
—(Bell Photos.)

11-Pl. Bell Helicopter

LARGEST helicopter in the familiar Bell series is the new H-12, produced for the U. S. Air Force. Powered by a Pratt & Whitney R-1340 engine rated at 600 hp., it is in the 7,000-lb. category with a useful load of over 2,000 lbs. and can carry 10 persons in addition to the pilot. Cruising speed is 85 mph., and normal fuel capacity provides a range of 500 miles.

In military utilization, it can carry 8 fully-equipped infantrymen and land them at or within feet of their destination at or near the front, eliminating fatiguing treks to forward areas. Five soldiers are seated across the back of the cabin, three just ahead. Very large doors allow rapid and easy interior loading of litters when the H-12 is used as an air ambulance. For supply, it is easily loaded with such cargoes as ammunition, food, medicines and even machinery or mechanical devices. For air rescue over sea or land, it has a unique hatch in its cabin floor, through which survivors can be cable-hauled inside with the aid of a power hoist in the craft. ★ ★ ★

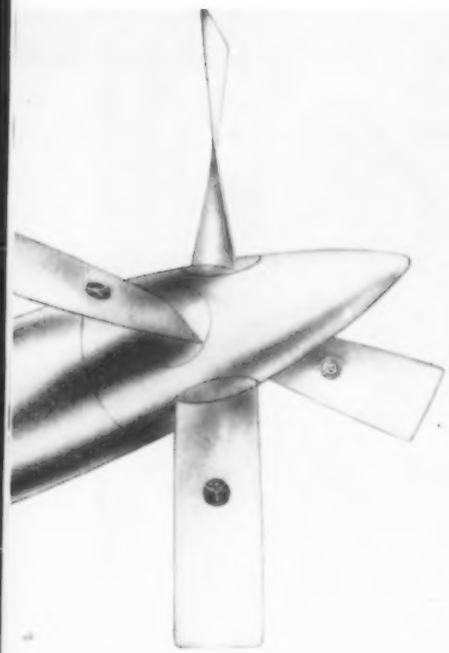
Big Bell has single main rotor (below, left). In photo above, pilot from "disabled" airplane is cable-hoisted into cabin from life raft while air rescue 'copter hovers. Method of loading litters is demonstrated in scene at bottom right.
—(Bell Photos.)

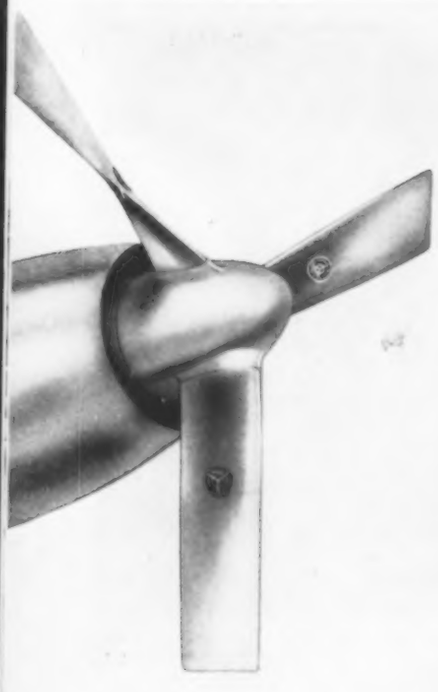


Dual-rotation Turbolectric for transonic speeds.

Supersonic Propellers

Spectacular progress is revealed by Curtiss





Four-bladed model shown above is capable of supersonic speeds, says Curtiss. Three-bladed Turbolectric at bottom is subsonic.
—(Curtiss Propeller Drawings.)

RECENT progress indicates the necessity for a re-assessment of the propeller's value to turbine-powered aircraft for very high speeds, with Curtiss-Wright's Propeller Division revealing that its new "Turbolectric" propeller for turbines is now available for experimental subsonic, transonic and even supersonic applications.

Speeds of 1,000 to 1,200 mph. can be achieved by propeller-driven aircraft of the future, according to the company, which announced the new propellers with this statement: "Initially, the new propellers will be used in aircraft capable of cruising at 500 to 600 mph. However, the research on which they are based indicates that twice these speeds can be achieved in propeller-driven aircraft of the future." Heretofore, it was generally believed that propeller craft were limited to speeds below 500 mph.

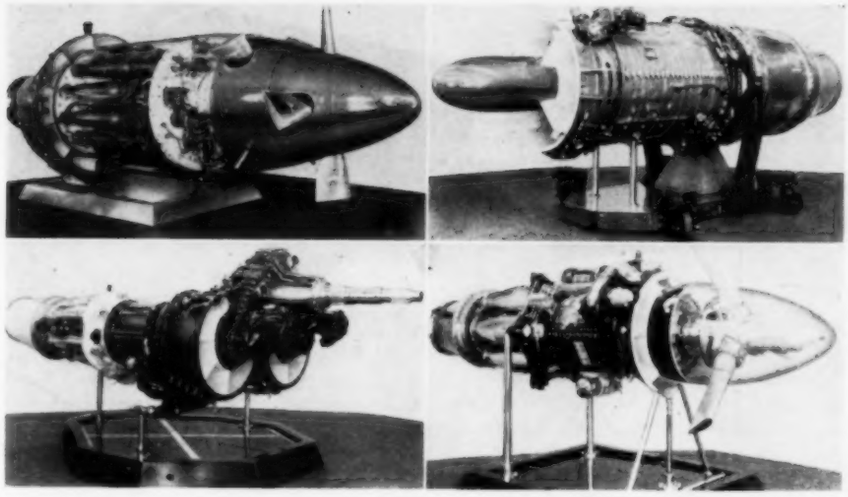
One of the first installations will be an Air Force application of Turbolectrics to a forthcoming turbo-prop version of the huge Douglas C-124 troop-cargo transport. Turbolectric models are now on test by the Air Materiel Command at Wright-Patterson Air Force Base.

Disclosure of details of the new models followed Curtiss-Wright's acquisition of a complete line of British turbo-prop engines through agreements recently negotiated. The new propellers will match the present and future performance characteristics of these power plants. They are the Armstrong-Siddeley line of gas turbines and include four current types covering the range from 1,000 hp. to 7,200 lbs. thrust. Largest of the line is the new Sapphire, said to be the world's most powerful turbo-jet engine. It has passed a 150-hr. British service-type test at a rating of 7,200 lbs. static thrust, said to exceed the thrust of any other type-tested gas turbine by at least 1,000 lbs.

Significantly enough, Curtiss asserts that its new propeller designs have attained efficiencies even higher than was possible with reciprocating engines. Flight efficiencies of the subsonic and transonic propellers will be at substantially high levels, with values up to 80-90% at cruising speed and 80% at high speeds up to .8 Mach number. These values, according to Curtiss, have been proved in flight and wind tunnel tests. Engineering studies indicate that supersonic propellers of the new design will maintain equivalent high-speed efficiency into the sonic region.

The blades are rectangular in plan form, of hollow steel, with thickness ratios of less than .050 at the ¾ radius section—as thin as possible while embodying structural integrity to absorb the large powers developed by turbo-prop engines. Low-drag NACA 16- or 6X series airfoils are used. Blade pitch distribution, section thinness and plan form refinements are responsible for the new design's high efficiency. Blade diameters vary, being from 13 to 21 ft.

The new Turbolectrics are available



British jets bought by Wright include three turbo-props and one pure jet. At top are the 4,000-hp. Python (left) and Sapphire, rated at 7,200 lbs. thrust. Below are the Double Mamba and Mamba, single units of which are rated at over 1,000 hp.
—(Wright Photos.)

Wright Gets British Jets from Armstrong-Siddeley

A LONG-TERM agreement between Wright Aeronautical Corporation and Armstrong-Siddeley Motors, Ltd., of England provides for joint engineering and technical developments and means that Wright acquires a proved line of British gas turbines ranging up to 7,200 lbs. thrust. Commenting on the multi-million dollar deal, President Roy T. Hurley of Wright said the agreement "brings into close unification the largest group of engine and propeller manufacturing facilities in the world." He said the U. S.-British collaboration will "speed up development, eliminate certain undesirable duplications and result in better engines" and that the end results will be available for introduction into items now under contract to the U. S. armed forces.

Chief among the newly-acquired engines is the new Armstrong-Siddeley Sapphire, described as the world's most powerful jet engine and rated 7,200 lbs. thrust. The Sapphire had been taken off the British secret list only recently when it was disclosed as being installed in a Gloster Meteor 8. ★ ★ ★

in several types—single rotation subsonic, dual rotation subsonic and transonic, and single rotation supersonic. Single rotation subsonic models have three or four blades, depending on the application, while dual rotation models have six or eight blades for different applications. Power ranges include 2,500 to 10,000 shaft horsepower for single-rotation subsonic models, and 5,000 to 20,000 shaft horsepower for dual-rotation subsonic or transonic models.

All of the Turbolectrics utilize the single-unit forged steel hub and electro-mechanical pitch-changing principles already proved in Curtiss-Wright propellers operating on the B-36. Because the turbo-prop engine is essentially a constant-speed power plant, developing much higher powers for a given size and weight but having more critical over-speed and over-temperature limits, its propeller must absorb greater power and have more exacting control response characteristics than required for propellers operating with reciprocating engines. The turbo-prop engine develops maximum performance at maximum permissible rpm. and temperature and these must be maintained within very close limits by coordinated adjustment of blade angle and fuel flow. Therefore the propeller control must be incorporated as an integral part of the turbo-prop engine control system.

For turbo-prop control requirements, Curtiss has developed a new blade angle governor control based on the control of rpm. by blade angle adjustment, and an alternate, complete, coordinated turbo-prop control system based on control of temperature by blade angle adjustment and control of fuel flow adjustment. This system is divided into two operating regimes: (1) The governing regime to provide constant-speed operation during take-off and all flight conditions, with coordination of turbine power and propeller blade angle automatically controlled; and (2) the Beta regime (blade angle follow-up) for all ground-handling operations, including reverse thrust. In the latter regime, turbine power and propeller blade angle settings "follow up" the position of the power control lever in accordance with a pre-determined or scheduled relationship. Feathering is controlled by an individual switch, mounted near the pilot's control lever. Operation of this switch overrides all other controls and energizes the increase-pitch clutch directly.

Aerodynamic spinners are designed to meet operating requirements for each installation. For those on which compressor air is admitted immediately behind the propeller disc, two types of engine nose air inlet spinners can be furnished. One is an NACA-type D for 90% recovery of inlet pressure, and the other is an NACA-type E, for greater inlet pressure recovery in the order of about 95-98%.

Protection from ice accretion is provided not only on the blades but on the spinners. Electrically heated, thermal de-icing systems of either the external or internal heating element types are available. An alternate heated-air type thermal de-icing system can also be furnished. This operates with heated air inside the hollow steel blades, either from a propeller-mounted burner or from other sources of heated air available in the airplane. The heated air is ducted through both the hollow blade and the spinner, as on the B-36 Curtiss propeller installation.

The Curtiss Turbolectric propeller can be installed on any type of turbo-prop engine. Three configurations include: (1) Single turbine engine, with compressor coupled to output shaft driving propeller; (2) single turbine engine, with propeller driven by separate turbine wheel, and (3) two turbine units driving propeller through a common gear box. ★ ★ ★

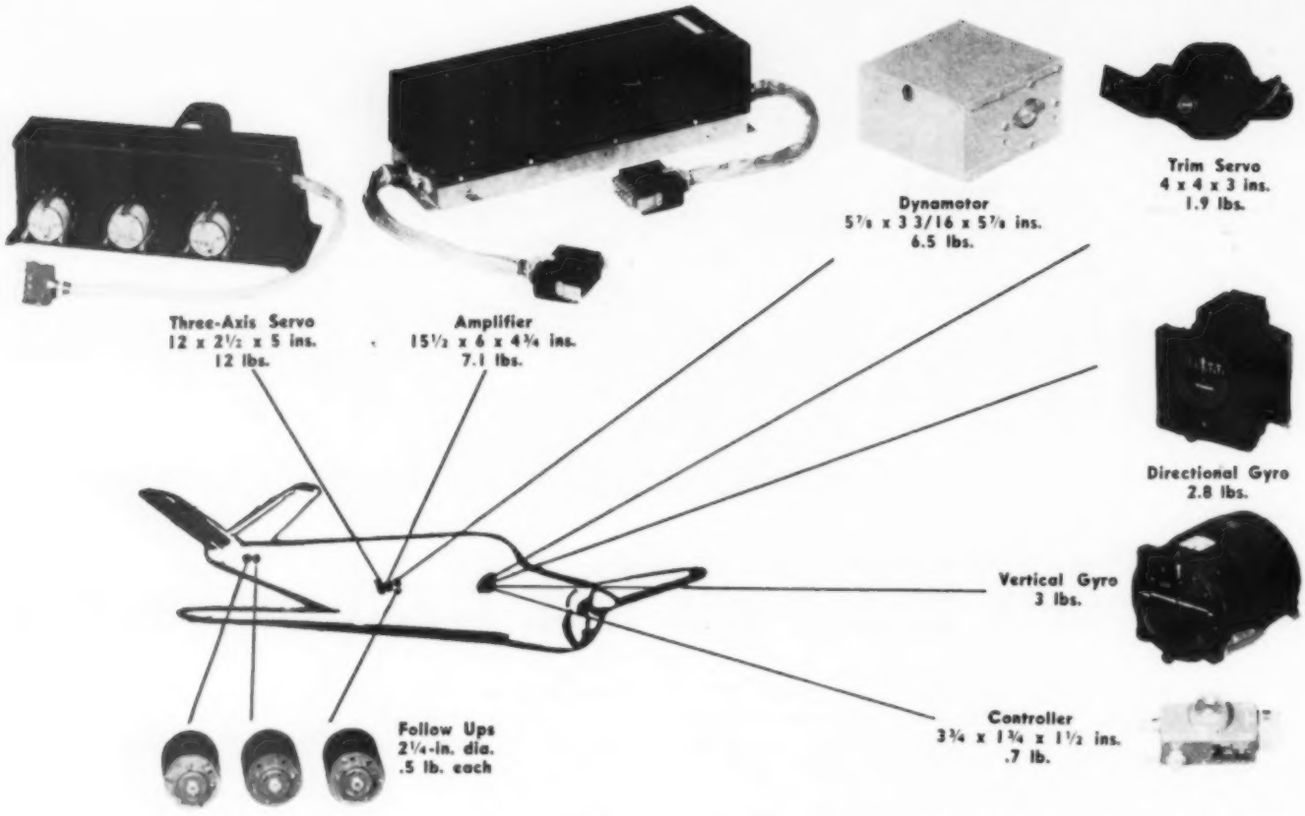


Diagram shows component details of Lear L-2 and their installation in a Bonanza. Gyros supply signals to amplifier, which feeds them to electro-mechanical servos. These actuate controls automatically to maintain trim and heading. Follow Ups limit control movements to the amplitude of the corrective signals. Controller shown is prototype—production model is pictured on opposite page at top. (SOUTHERN FLIGHT Diagram.)

Autopilot for Lightplanes

Bill Lear, the wizard of aircraft electro-mechanics, again contributes to aviation progress

By TOM ASHLEY

A GREAT new era in private flying is dawning for people, most of them business men, who fly their own airplanes for the transportation that's in them. For the first time they now have available a more practical kind of flying than they ever experienced: Safer, less fatiguing, more comfortable autopilot flying that makes for more dependable transportation.

The autopilot era for private flying actually is already here and with us, an accomplished fact for some private owners and soon to be a reality for interested others the minute they receive an autopilot flight demonstration. Such an historical milestone in aeronautical progress has been ushered in by the recent marketing of aviation's first approved automatic pilot for small airplanes, the remarkable lightweight Lear L-2 Autopilot.

Large craft and transports long ago were made more efficient through automatic piloting. But for smaller planes the automatic age is just getting under way and it is the little Lear which has given it the big impetus long awaited by private fliers. Far less expensive than the big ones, it is small and light enough to fit in the private airplane and still leave room and payload for some passengers and baggage and gasoline.

No designer's paper doodle or tomorrow's promise, the Lear L-2 is already in production at an ever-expanding rate of 30 per month which soon will reach 100 units monthly. Such accelerated production became necessary to meet the rising demand on the heels of the first 10 Lear installations in Beechcraft Bonanzas, Cessna 190's and Ryan Navions. Approved engineering drawings and kits for installation in those popular planes and others are ready to go with deliveries.

The automatic pilot's success didn't just happen, it emerged from 6 years of engineering development and about 3,000 hours of flight experimentation at the hands of William Powell Lear of aircraft radio fame. His progeny we'll call *"Little Willie"*—the new Lear L-2 Autopilot.

How small and how priced? The complete Lear unit costs $2,990. Add the cost of installation, which has averaged about 100 man-hours for types such as the Bonanza and about 200 man-hours for the Twin Beech. Total weight of the unit is 29.7 lbs. plus 5.8 lbs. for the directional and

vertical gyros (if your ship already has these, you don't add weight for them).

For the equivalent of about 6 gals. of gasoline or one piece of baggage in weight, plus an investment of about $3,300, you can have a turn-key autopilot job and experience a new standard of flying which is bound to attract, renew or skyrocket your faith in private flying and have you completing more cross-country trips than ever before with far less effort and lots better results.

How It Works

Small as it is, *Little Willie* performs as effortlessly and as remarkably as its big brother in the transports. When the airplane's trim is disturbed even the slightest, *Little Willie* senses it with vertical and horizon gyroscopes far more quickly and definitely than the human sense of feel can do. Then, *Junior's* brain of circuits and tubes and amplifiers signals corrective pressures to mechanical servos, which in turn actuate aileron, rudder or elevator surfaces in time to restore and maintain precise trim even before full displacement can occur.

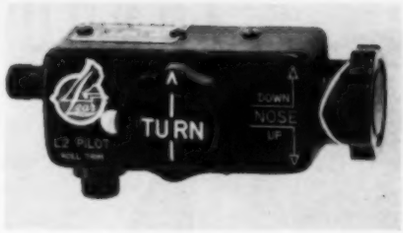
It is a performance that has to be eye-witnessed and experienced in a lightplane to be appreciated. Hands off, you watch as the wheel flicks slightly to correct for an unfelt gust. You grin as the trim-tab wheel effortlessly turns a notch or so to correct the nose, all by itself without being touched.

Automatic throughout, the Lear L-2 maintains trim by balancing stick force as well as by governing attitude, this stick force being maintained at zero pressure at all times. Flip off the autopilot at any time and the airplane is in perfect trim. This is true even when you use the autopilot for maneuvering. Its controller has a small knob which you can turn right or left for coordinated turns and another one which can be rotated fore and aft for glide or climb, the two being used together for climbing or gliding turns. Throughout these maneuvers, the airplane's trim remains perfect when the switch is flipped off.

Slip-clutches in the servos allow you to over-ride the autopilot at any time and with a minimum of effort. It is described as being "fail-safe." In addition, the engage switch is conveniently mounted on the control wheel. It also is controlled by a master autopilot switch.

Why Use An Autopilot?

While piloting a lightplane on a trip requires remarkably little manual effort because of the excellent aero-



Controller, mounted on panel at control column, has knob for coordinated turns and knob for glide or climb. L-2 is a maneuvering autopilot and full travel of turn knob gives one-needle-width turn. Nose knob operated in conjunction with turn knob gives climbing or gliding turns. —(Lear Photo.)

dynamic stability designed into the craft, it does demand constant attention and, perhaps more than is generally realized, it demands a constant shadow of pressure on the controls. This pressure is taken for granted, is an accepted part of piloting and in smooth air is applied through reflexes without conscious effort. It is not the pounds of energy or mental calculation on any given correction of control which sooner or later shows up as fatigue. It is the never-ending constancy of attention as well as pressure to maintain flight trim, a continuous handicap against map reading, conversation with rear-seat occupants, or attention to any details which might prove distracting.

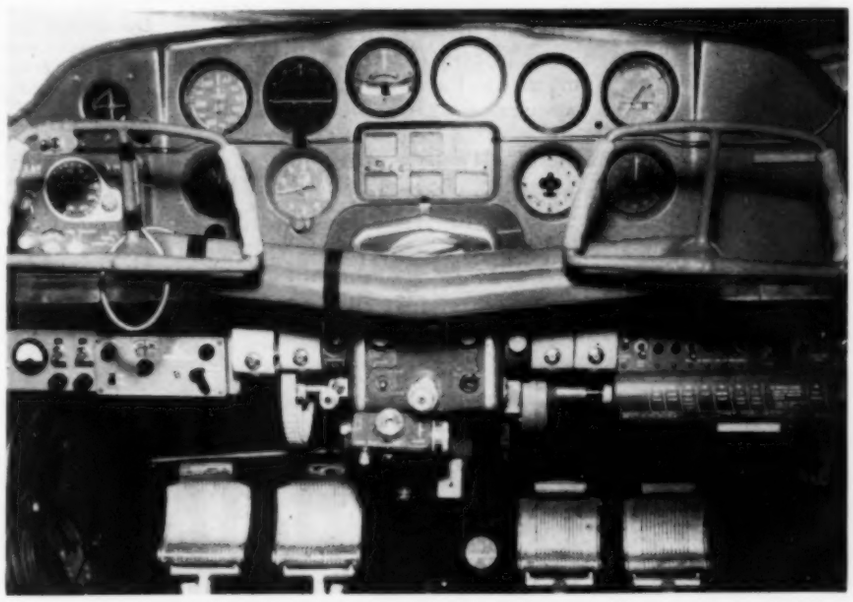
Relax for a few moments to find a map, spread it wide, pin-point a small area for study and you glance up to lift a wing and correct your heading. Turn your head to face the rear seat for a conversation, or reach back for something, and you either interrupt this activity to glance forward and correct your trim or allow the wing to dip and the turn to progress and eventually take you completely off course, and nose down. After so long a time on the trip, you give up any such ideas of relaxation and fly the airplane constantly, or else you relax and tolerate the loss of trim with its sloppy effects on your airplane's performance efficiency and your passengers' comfort.

Sometimes this constancy also becomes coupled with actual labor. In rough air you have to work to maintain most efficient and comfortable trim. A gust disturbs the trim and you correct. Then you sit a little more erect, tighten your seat belt, ride the rudders a bit more and find yourself trying to anticipate the rough air's displacement of controls. When the going really gets rough, as in hot weather at comparatively low altitudes, you're a pretty busy man with all the sawing you have to go through with hands and feet and you're tired in no time. The higher you go and still have to work, the more fatigue you experience because oxygen-lack begins to take its imperceptible toll at surprisingly low levels when the trip stretches out beyond a couple of hours.

You'd like for it to be different, but you don't mind too much because all this is a part of flying. At least you say as much to yourself and your friends. But some people soon find themselves flying less and less because of that constant two ounces of pres-

(Continued on page 24)

Bonanza cockpit showing L-2 installation. Controller is beneath throttle. Ready switch is on left wheel (master autopilot switch is in switch panel at far right). Black-faced instruments are gyros. Note trim tab servo on opposite side of control column from elevator trim wheel. —(Lear Photo.)



ANNOUNCING THE CURTISS

▶ Here . . . in the Turbolectric Propellers . . . is Curtiss-Wright's answer to the demand for dependable, efficient means of converting the tremendous power of turboprop engines into high performance thrust . . . with precision of control under all aircraft operating conditions.

▶ Included in this advanced series of propellers are single and dual rotation types . . . subsonic, trans-sonic, and supersonic models . . . engineered to harness effectively turboprops from 2500 to 20,000 horsepower . . . designed to meet a wide range of aircraft installation requirements . . . equipped to provide the same reliability, durability and versatility upon which the world-wide reputation of Curtiss Electric Propellers for piston-engines is founded.

▶ The development and introduction of the Turbolectric series highlight Curtiss-Wright's leadership as the foremost manufacturer of high capacity aircraft propellers. More than three-quarters of all propellers built today for use with aircraft engines of 3000 horsepower and more are built by Curtiss-Wright. No other organization approaches Curtiss-Wright's demonstrated ability and experience in harnessing high horsepower — ability and experience which, blended skillfully with the results of forward-looking engineering research, have produced the Turbolectrics.

MANY SERVICE-PROVED FEATURES

▶ The Turbolectrics are new only in the sense that they are specifically designed for use with turboprop engines. Most of their major features and components — and the principles of operation on which they are based — have already been proved in service. Like their piston-engine counterparts, the Turbolectrics are distinguished by:

Hollow-steel blades *of Curtiss monocoque construction, backed by over 125,000,000 hours of operation in military and commercial aircraft.*

Single-unit forged hubs, *a similarly time-tested design particularly adaptable to the structural requirements of high-speed turboprop engines.*

Simple, dependable electro-mechanical pitch change mechanism, *in which the power to change pitch is taken directly from the rotation of the propeller shaft. Developed and proved with the Curtiss-Wright propeller used exclusively on the B-36 bomber, this system eliminates need for complex hydraulics and electronics and is unaffected by temperature or altitude.*

Automatic synchronization *for multi-engined aircraft.*

The safety and dependability of reverse thrust *for smooth air-cushioned landings and more effective braking. Curtiss-Wright propellers have been reversed over 2,000,000 times in airline use alone.*

Electrical or heated-air *de-icing.*

Rate of pitch change *substantially increased throughout the entire range of reverse to feather.*

▶ **For brochure describing the Curtiss-Wright Turbolectric Propellers, write Propeller Division, Curtiss-Wright Corporation, Caldwell, N. J., on your company letterhead.**

CURTISS WRIGHT

Turbolectric PROPELLERS

for Turboprop Engines ranging from 2500 to 20,000 Horsepower

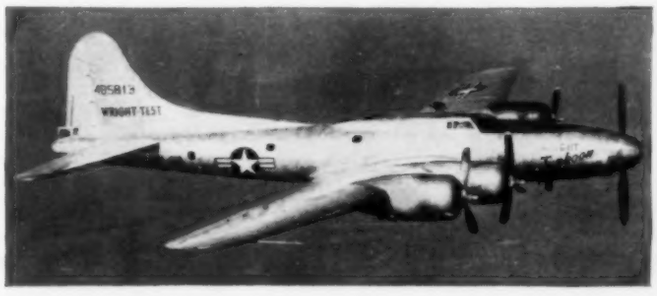
DEVELOPED THROUGH YEARS OF RESEARCH AND ENGINEERING

▶ The refinement and adaptation of these proved Curtiss-Wright features to the special requirements of the turboprop engine were successfully accomplished through an exhaustive research and development program dating back to 1943 . . . and marked by gruelling, simulated service and actual flight tests.

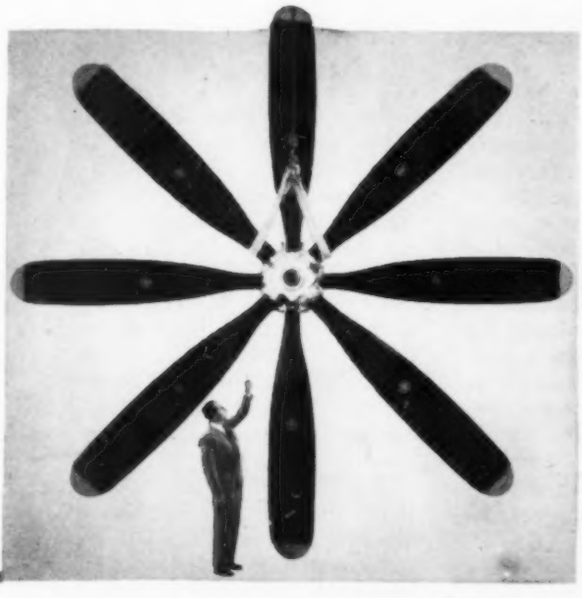
▶ As early as 1946, Curtiss-Wright turboprop propellers were flight-tested on the TG-100 turboprop installed in the XC-113 experimental airplane. Two years later, the possibilities of the *Turbolectric* were spectacularly demonstrated by another of its predecessors. Fitted to a T-35 turboprop installed in the nose of a special five-engined B-17 "flying test stand," this propeller flew the airplane with the propellers of the four wing engines feathered.

▶ With the development of the Curtiss-Wright Turbolectric propellers, the aviation industry can look forward to more complete utilization of the gas turbine engine's potentialities.

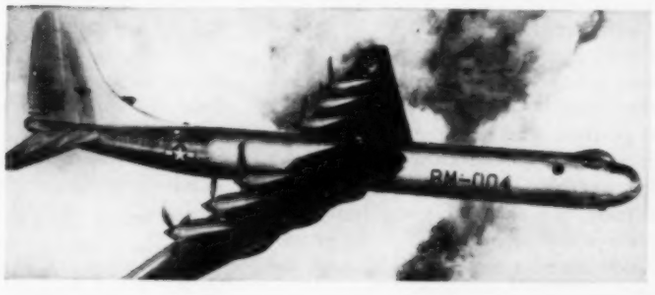
The Turbolectric series is the result of exhaustive research and development of gas turbine engine propellers combined with Curtiss-Wright's years of experience in harnessing high horsepower. Among the early tests of a complete Curtiss-Wright turboprop propeller was one made in 1946 on TG-100 engines installed in the experimental XC-113 airplane shown above.



Propelled solely by a predecessor of the Turbolectric Propellers fitted to a high-powered T-35 turboprop in the nose, this special Boeing B-17 "flying test stand" gave a spectacular flight demonstration with the four propellers of its wing engines feathered.



The world's largest and highest capacity propeller is a Curtiss-Wright Turbolectric. Designed for use with an extremely high-powered turboprop engine, this 19-foot diameter, eight-bladed flight model now being tested by the Air Force, employs the dual rotation principle developed by Curtiss-Wright in 1943.



The distinctive electro-mechanical pitch changing mechanism and other features of the Turbolectric series are based upon experience gained through thousands of hours of operation under extremes of temperature and altitude with the world's largest production propeller built by Curtiss-Wright and used exclusively by the Air Force to equip its squadrons of B-36 Inter-continental bombers.

AUTOPILOT

(Continued from page 21)

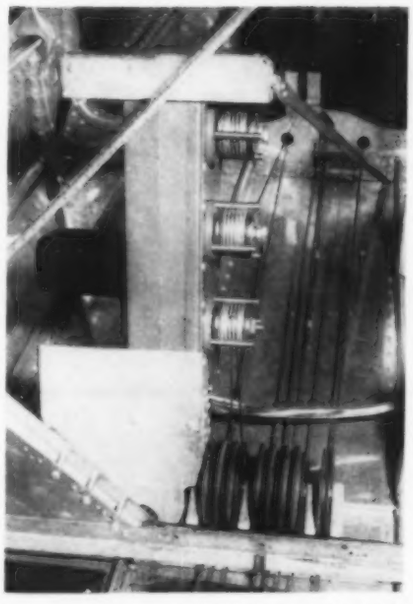
sure so necessary to piloting. They don't always blame it on the airplane —it's old man weather, or the heat, or the terrain that gets the most cussin'. What actually happens is that flying suffers from these factors. Without them you would do more flying because it would require less work at the wheel, consequently your airplane would be far more useful after you justified additional trips. As wonderful as your airplane actually is from a standpoint of performance efficiency, it still cannot smooth out such things as thermals and gusts or even a control's inherent oscillations. If this were possible through super-duper juggling of the laws of physics, some aerodynamicist would have struck it rich long years ago. But the men with the slide-rules still have to leave a lot of performance up to the stranger behind the wheel who decides all by himself how best to utilize or ignore the airplane's performance.

Uses for the L-2

While the most obvious use for the Lear L-2 is for cruising the airplane, it has others. After taking off and climbing out of an airport, for example, you can let *Little Willie* take over as soon as you're well out of the traffic pattern. Dial the speed and rate of climb you want and it will hold to your setting precisely. If the air is gusty it can do this better than you can—it applies corrective pressures before displacement is complete—and it can smooth out the controls while you attend to maps, radio or other corrective details.

While instrument flying in a single-engine airplane will not be encouraged here, some owners are properly trained and equipped to undertake it when necessary and these will find the L-2 a wonderful aide. In addition to eliminating the manual labor involved in handling the controls, and thereby making for relaxation and less fatigue to promote clear thinking and safety in that regard, it allows the instrument pilot full freedom to devote to other details. If he wants to hold his position over a range, for example, he simply dials the turn knob all the way over in the direction he wants to turn and the L-2 gives him a 1-needle-width coordinated turn, maintaining speed and trim all around the turn.

One lightplane owner who has a Lear L-2 recently tested it the hard way by flying through extremely rough frontal conditions—that is, he sat there and watched while the L-2 flew him through. He swears it held both attitude and heading far more efficiently than he could have done. Furthermore, it did not subject the airplane to heavy loads as he would have done by manual control. Through the roughest turbulence, the wheel and trim tab automatically and smoothly corrected for rapid-fire changes in trim. Rough weather, comments Bill Lear, is when you need the L-2 the most.



Three-axis servo of L-2 is mounted behind baggage compartment, as seen in this view looking rearward in fuselage. From top to bottom, capstans are for rudder, elevator and aileron.
—(Lear Photo.)

Most lightplane pilots prefer to stay away from frontal conditions and beneath the overcast. For them, too, there is need for autopiloting. If the overcast is low, navigation becomes more of a problem. But with the L-2 holding everything centered, you have nothing to do but navigate. This promotes pilot efficiency, especially at night when you might want to complete a long trip by flying briefly after sunset in a properly-equipped airplane. Instead of tensing while staring at lighted instruments, you relax while *Little Willie* works. If there's plenty of room underneath for you to go over the top at some interval during your cross-country, you can do so with confidence in the L-2's ability to handle a let-down smoothly and without spiraling should the occasion develop.

Relaxation while the L-2 does the work is so genuine that you might want to carry along someone to hold a lookout while you enjoy an occasional snooze. The temptation is there, especially when you're a mile high or more with nothing else to do until the next check-point or fuel-valving comes up. This mile-high business comes easily to some people we know and we honestly believe Lear ought to furnish a $3.95 kitchen timer with each L-2—mounted on the panel, it can be set for 5, 10 or 45 minutes and when time's up a bell goes off.

A Business Man's Experience

For a demonstration of the L-2, we boarded Bill Lear's recently converted Lodestar on one of his cross-country trips and wound up at his Grand Rapids factory. In a Lear Bonanza we saw the L-2 put through all the paces. While we were there we also encountered Merrill C. Meigs, hard-working publisher of the Chicago Herald-American and a Hearst executive who uses a Bonanza to visit Hearst operations in many cities on a busy schedule. He has had his L-2 for quite a while now, it being one of the first units. But for his many years of private flying and prominence in aviation (he started after World War I), Meigs is a typical flying business executive who does his own piloting.

"After I got the L-2, I began using the Bonanza more and more. Giving this some thought, it dawned on me that I had not been utilizing it as much as possible. The truth was that I was tiring on the longer trips due to that never-ending need for holding pressure which characterizes any airplane. Rough air had made me feel my years, I suppose. But I didn't complain—I just didn't fly as much as formerly. Then I got the L-2 and it all changed. Now I find myself wanting to fly more than ever. I flip the switch and settle back and enjoy flying. My working days behind the wheel are over—the L-2 holds pressure for me. I can even study a map at length, knowing that I don't have to keep looking up and lifting a wing. Just knowing this relaxes me. So I fly farther and more frequently and arrive more comfortable than ever."

Merrill Meigs was sincere in his praise for the L-2. He now utilizes his airplane nearly twice as much as formerly, thanks strictly to the L-2. That chalks up quite an accomplishment for *Little Willie*—making an uncomplaining, satisfied customer even happier.

There is neither magic nor mystery about the Lear L-2 because none is needed—as automatic pilots go, it is staple merchandise. It is not a radical concoction of screwball theories or gimmicks but a practical, logical combination of long-known, experience-proved, accepted electro-mechanical devices. Its great significance and contribution to aviation is not the mere mechanics of autopiloting but its abili-

ty to perform these mechanics in small planes with small dimensions and light weight. As such it represents an electro-mechanical marvel of engineering and one of the truly outstanding accomplishments in modern miniaturization, which is making high performance airplanes practical, especially in very high-speed military aircraft such as jet fighters and guided rocket missiles.

Milestone in Jet Progress

Lightplanes and jet fighters have little in common, but in autopiloting they are on common ground. In fact, the first successful autopilots for both were developed almost simultaneously —Lear's L-2 for lightplanes and F-5 for jet fighters. Bill Lear and his researchers perfected them practically side by side, but the F-5 became successful almost two years earlier because its development was accelerated in the interests of military necessity. It was ordered in million-dollar quantities in 1949 by the U. S. Air Force and is now the standard autopilot for jet fighters. Of great significance, the Lear F-5 gives jet pilots automatic approach control—if low on fuel, for example, they can be certain of a precision landing on the first approach, without going around. Instrument landing approach has to be right the first time in a jet fighter—a go-around can prove disastrous because of very high fuel consumption and other conditions especially in a combat zone. Lear's F-5 makes the instrument approach precisely and automatically.

Fighters, like lightplanes, have little space for autopilots. As wings become thinner and shorter, and tails become smaller and smaller, stability becomes a greater problem for very fast fighters. Moreover, over-control at very high speeds poses serious problems in the matter of subjecting the structure to severe G loads. These and other important considerations make the military F-5 Autopilot a valuable accessory to modern jet flying. Bill Lear's miniaturized robot pilot is giving jet pilots stability, smooth trim changes which do not overload the structure, comfort and freedom from fatigue.

"Jet Pilot Lear" he is now known as, and it wouldn't surprise this writer if Bill hasn't already become the world's first supersonic business executive. If the jets he is testing have the speed, he's bound to try to fly faster than sound.

Lear probably sleeps less and flies more than any leading aviation executive. He's been doing it for years. But when the USAF gave him a physical check for jet flying, the 49-yr.-old wizard of electronics and radio passed with flying colors. They told him he had the stamina of a young cadet. This he needed, for he is now flying jet experimental tests. He has been through the most rigorous altitude chamber decompression tests. He has the ejector-seat test behind him, having calmly pulled the trigger which sent him and his explosive pilot-seat hurtling skyward up a vertical pole.

Making History in Radio

Lear made a name for himself in radio before he undertook aircraft radio developments. In 1921 he built the first auto radio in an experiment, later designing the first successfully-marketed auto radio as radio engineer for the Galvin Manufacturing Co., of Chicago—it was the "Motorola" and it made Galvin famous. He made radio history again when he perfected the first amplifier with built-in loudspeaker for Grunow (which later became Majestic), this development launching that firm's spectacular success with home radios.

He had organized several laboratories and firms of his own and with partnerships before he came up with the predecessor of the present-day Lear, Inc. This was in 1930, and times were tough for the youthful radio wizard despite brief periods of prosperity. He opened in a shack behind the hangar at Chicago's Curtiss-Reynolds Airport, buying an airplane and deciding to concentrate on aircraft radio. He introduced his first two-way aircraft set in 1932, the "Lear Radioaire." There were only 60 radio beacons covering the nation and less than 300 airplanes were radio-equipped. But his two-way "Radioaire" was a success—Stinson Aircraft gave Lear the industry's first quantity order for radios, buying 100 sets. This was in part payment for Bill's new 4-pl. Stinson, which replaced his old Fleet. He had learned to fly in 1923-24 in Chicago, renting war-surplus JN4D's.

Next year he moved lock, stock and barrel to New York and a fresh start on a modest scale. To pay the rent and for day-to-day expenses, he invented a vibrator power pack and sold it to a manufacturer. Money was still a problem, so Lear devised an impressive gadget and marched into RCA determined to make a sale large enough to carry him a few months without being hounded by collectors. It was Friday the 13th. He came out of RCA with $250,000—he had sold the big corporation a control for receivers which it later marketed under the name of "The Magic Brain," a household word to millions.

Now able to devote more time to aircraft projects, he came up in 1935 with his "Lear-O-Scope," the first commercial radio direction finder with visual left-right indication. More than 100 were sold, many to famous airmen. He again made history in 1940 with his "Learmatic Navigator," which won for him the Frank M. Hawks Memorial Award for outstanding contributions to aircraft radio.

(Continued on page 39)

Tribute to a 1937 Model

"Damn good airplane," Ben called it, that job he and Gordon turned out,
With the stiff narrow gear and big fin on the rear,
And that solid old Wright on the snout.

"Hot pilots' airplane," they snorted, those others who chatter no more,
But that straight plywood wing is a most comforting thing
When Mother Nature lets go with a roar.

She comes down like a brick and she's a challenge to land,
But you don't throttle back when the thunderheads crack,
And she never "flies out of your hand."

Rugged, streamlined, and fast, but blind as a bat on the ground,
She gets off like a hare and climbs up the air
As if for Heaven she's bound.

She cruises an honest one sixty, and never grumbles at loads.
She's had plenty abuse and much rough field use,
But still smooths out the sky roads.

The new ships are outstanding, and they sure look mighty fine,
But when the weather is rough and the going is tough,
I'LL take that old Howard of mine!

D. P. J.

Veteran Air Pilots Association

If you have a minimum of 1,500 certified solo hours and have been flying for at least ten years you can qualify for membership in the Veteran Air Pilots Association. Applications should be sent to Leslie P. Huey, Louderman Building, St. Louis.

By JIM WHEELER

A MEMBER of VAP for ten years, ARCHIE W. LEAGUE has been in aviation for as long as he can remember. His first job was helping to rebuild a Hall-Scott Standard cracked up by Cloyd Clevenger in St. Louis during the early 20's. In 1926 League learned to fly in an OX Standard, started barnstorming with only 10 hrs. solo, and returned to ole home town in the late 20's with his own flying circus to play the Butler County Fair.

As assistant airport manager for the City of St. Louis before the airport had a control tower, his main job was directing traffic from a wheelbarrow, waving a checkered flag and a red one. When the city decided to equip a control tower, he bought and installed the equipment and served as tower controller from the day it was opened in 1932 until the city finally appropriated funds to hire operators quite some time later.

Archie W. League

League became active in Naval reserve aviation but after 10 years as a petty officer the Navy turned him down for a flying rating because he was "too short." However, the Air Corps Reserve thought he was tall enough, and in 1938 gave him a second lieutenancy. Meanwhile, he had joined the CAA in its Airway Traffic Control at Pittsburgh in 1937, returning to St. Louis to open, with Bud Stock, the new St. Louis Airway Traffic Control Center. In 1940 he entered active military duty with the 110th Observation Squadron, having resigned from the Air Corps Reserve to join the Missouri National Guard. Nearly 6 years of service in World War II consisted mostly of chasing Japs around in the New Guinea-Bismarck Sea and Solomons areas, and he eventually commanded a recco group in the 5th Air Force, finally being shipped home on a hospital boat with the usual number of ribbons and combat decorations. He rejoined the CAA in 1946 and later was appointed 5th Region chief of planning and evaluation, his present job. Living in Kansas City, he's a bird Colonel in the Air Force Reserve, being deputy wing commander of a troop carrier wing.

H. R. BAZLEY is another oldtimer in the Veteran Air Pilots Association. His flying started in World War I when he was a 2nd looie in the Aviation Section of the Signal Corps from October, 1917, until May, 1919. Bazley's record is brief and to the point. He has remained in the air reserves and still is, with the rank of major. 1920-24, president of Atlantic Aviation Service, Inc.; 1924-27, with Gulf Oil Corp.; 1927-29, general manager of Brilliant Airways, Inc.; 1929-31, manager of Pittsburgh Branch, Curtiss-Wright Flying Service; 1932-36, aviation director, Allegheny County, Pittsburgh; 1936-37, assistant director, Pennsylvania Airport Section, Airport Division; 1937-39, executive director, Pennsylvania aeronautics division; 1939 to date, vice president and director, All American Airways, Inc.

COMMANDER R. J. GREENE became interested in aviation in 1911 as a boy air model enthusiast in Chicago, watching people like Matty Laird building the real thing at Cicero. During World War I he was an aviation rigger in the Navy in England, but he didn't take up flying until 1924, when he enrolled in the Naval Air Reserve in New York. This was interrupted, however, but he finally flew in 1927 at Great Lakes, Ill., soloing an N-9 seaplane at the end of 5½ hrs. In 1928 he received his wings as one of the so-called "90-day wonders" because 90 hrs. was required for the Navy wings. He served for eighteen months beginning in 1935 as an instructor, soloing about 90 students at Pensacola. In 1941 he became operations officer at the Naval Air Station at New York and as emergency patrol squadron commander, making depth bomb attacks on enemy submarines which appeared off the coast.

Going overseas in 1943, he was commanding officer of Carrier Aircraft Service Unit 31 at Hilo, Hawaii, returning in 1945 as officer in charge of an aircraft commissioning unit at San Pedro. Since then, he has been serving as executive officer in the Naval Air Reserve Training Command, his last station being in Atlanta. In 23 years of flying, he has flown most of the various Navy types covered by that span and has 6,500 hrs. in the air.

RICHARD J. GATELY, who flies the R. M. Hollingshead Corporation's new Mallard out of Camden, N. J., began flying in 1936 at West Palm

H. R. Bazley

R. J. Greene

Richard J. Gately

Beach, Fla. His first flying job was piloting a Fairchild 24 for the distinguished Grover Loening, who commuted in the 24 between Long Island and the Wall Street seaplane base in Manhattan. For Midet Aviation, Gately flew Stinson Reliant and Bellanca Skyrocket float jobs in charter both in Jamaica, BWI, and Florida. He got an instrument rating in 1941 and went to work with TWA as co-pilot, resigning the next year to join the Air Corps as a service pilot. His commission came through a few months later and he flew the Hump in C-47's, during which he received the Air Medal and DFC. Returned to the States, he ferried bombers until his discharge in 1944. After a couple of years of pleasure flying, Gately returned to Midet Aviation, flying charter in a Widgeon and a Goose. Before joining Hollingshead, he flew a Goose in British Guiana a couple of months for BG Airways.

The first flight made by M. H. MEGREDY was with another VAP'er, ole Tom Park, then flying for Southwest Air Fast Express. He earned money as a grease monkey and by selling tickets for barnstormers to take flight instruction in 1930, but wound up building and flying gliders until 1937 when he finally soloed a powered plane. Megredy managed Funk Aircraft Co., in 1941-42, was a CPT-WTS instructor, an Air Force civilian instructor and a civilian pilot in the Ferry Command during the War. He is now a company pilot for Research, Inc., a geophysical company.

With a couple hundred hours of flying time, WILBUR L. PARIS of Louisville, Ky., joined the Royal Air Force in 1940 through the Clayton Knight Committee, transferring to the U. S. Navy in 1942 and served out

(Continued on page 33)

M. H. Megredy **Wilbur L. Paris**

Russell J. Wright **John K. Hoyt**

AIR ASSOCIATES

POSITIVE POSITIONING

ACTUATORS

Positive positioning control is assured in Air Associates actuators by using internal load-limiting switches. The back-pressure exerted adjusts the actuators automatically. This counteracts backlash and eliminates surface flutter as well as switch adjustments at installation and in service. Air Associates non-jamming actuators meet, or exceed, applicable AN specifications.

Air Associates designs and manufactures *electronic, hydraulic, electro-mechanical, pneumatic and miscellaneous* devices.

Also, twenty-two years' experience supplying the needs of manufacturers, airlines and airport operators has established Air Associates as the leading distributor of aircraft supplies.

Write For **ENGINEERING CATALOG**

AIR ASSOCIATES
INCORPORATED
Teterboro, New Jersey

DALLAS, TEXAS • CHICAGO, ILLINOIS • GLENDALE, CALIF.
EXPORT DEPARTMENT • CABLE ADDRESS 'AIRSOC,TETERBORO'

Serving the Nation in Aviation

Gathering of the Clan

Leading airport authorities assemble in the Southwest for important conferences

OCTOBER was a veritable "Airports Month" in the great Southwest, what with the 1950 Conference on Airport Management and Operations October 12-13 at the University of Oklahoma under joint sponsorship of that school and SOUTHERN FLIGHT, and the regular meeting of the CAA's Airports Advisory Committee the following week at Fort Worth.

While top priority at both meetings was given wartime mobilization plans and their effect on airports, a large measure of discussion took place on routine airport problems, especially at the 1950 Conference in Norman, Oklahoma.

Published proceedings of both meetings preclude the necessity of full coverage in these columns. Interested parties may obtain specific information on the 1950 Conference at Oklahoma University by writing SOUTHERN FLIGHT, and from the Airports Advisory Committee meeting by contacting Bob Cook, Executive Secretary, Office of Airports, Civil Aeronautics Administration, Washington 25, D. C.

Del Rentzel, newly appointed chairman of the Civil Aeronautics Board, made his first principal address before the 1950 Conference at OU since his appointment. Other major speakers at the Conference included: Bob Schmidt, Tucson airport manager; Melvin H. Nuss, Reading, Pa., president of the American Association of Airport Executives; Charles E. Hanst, CAA, Atlanta; A. B. Paterson, president, City of New Orleans Aviation Board and president of New Orleans Public Service Company; Garland Franks, San Angelo, Texas, city manager; Dr. James E. Mooney, airport maintenance and operation branch, office of airports, CAA, Washington; John H. Burke, Wiley Post Airport owner and operator, Oklahoma City; Frank Trumbauer, aviation development, CAA, Kansas City; Ellis Carson, Ord, Nebraska; Dr, W. K Andrau, Houston, Texas; E. G. (Slim) Kidwell, Central Airport owner, Los Angeles; J. A. Hudson, Highland Park Airport operator, Dallas; Walter E. Betsworth, vice-chairman, Airports Advisory Committee, and manager of the Waterloo, (Iowa) Municipal Airport.

Panel discussion leaders included Leonard Jurden, CAA Regional Administrator, Kansas City; David Leigh, manager, St. Louis Municipal Airport; Douglas Langstaff, New Orleans aviation director; E. H. Pickering, Air Market Associates, Dallas; Dr. E. O Rushing, Dallas; Mike Hackedorn, aviation division, Humble Oil & Refining Co., Houston; Wm. M. Berry, aviation development, CAA, Fort Worth; Joe Marriott, Regional Administrator, CAA, Los Angeles.

At the Fort Worth meeting of the Airports Advisory Group, government officials included Rentzel; Don Nyrop, newly appointed CAA Administrator; Phillips Moore, CAA director, office of airports; Bob Cook, office of airports and secretary of the AAC; Charles F. Horne, director, office of

Del Rentzel was there, only 5 days after assuming chairmanship of CAB and fresh out of his role as CAA Administrator. He's shown at mike with Dr. George L. Cross, President of the University of Oklahoma (right).
—(SOUTHERN FLIGHT Photo.)

Four of many prominent speakers at 1950 Conference on Airport Management and Operations are shown at right. At top are Melvin Nuss of Reading, Pa., president of American Association of Airport Executives, and Dr. James Mooney (right), CAA Airports Maintenance and Operations Branch, Washington. Below are Mike Hackedorn of Houston, Humble Oil Company aviation manager, and John Burke (right), Wiley Post Airport owner and operator of Oklahoma City and member of CAA Airports Advisory Committee.
—(SOUTHERN FLIGHT Photos.)

federal airways; Ernie Hensley, director, CAA office of aviation safety. A welcome guest at some of the sessions was former CAB chairman, Joe O'Connell, Jr., now a practicing attorney in Washington.

Members of the Airports Advisory Committee are A. B. Curry, Miami, Florida, chairman; Walter E. Betsworth, vice chairman; G. D. Albrecht, Memphis; John Berry, Cleveland; John Burke, Oklahoma City; John Gray, Atlanta; Art Hyde, Rockville, Maryland; Louis R. Inwood, Kansas City, Mo.; John N. Lavin, Spokane, Washington; Hervey F. Law, New York; Don W. Martin, Wilmington, Delaware; and R. W. F. (Bob) Schmidt, Tucson. Honorary members are Amon G. Carter of Fort Worth, host to the October meeting, and Arthur Godfrey. The group voted to hold their next meeting in Wilmington, Delaware. ★ ★ ★

Prominent airport managers and authorities engaged in conversations at the Conference are shown in these groups. In shirt sleeves, left to right, are Bill Crawford, 4th Region CAA legal counsel; William B. Catchings, CAA district airport engineer, Baton Rouge, La., and Douglas Outlaw Langstaff, New Orleans aviation director. At bottom, left to right, are: W. T. Brown, 4th Region CAA airport management chief; Bob Donahue, Seattle; W. K. McFall, Oklahoma City; Charles Hanst, 2nd Region CAA airport management chief; W. Russell Graham, Jr., Washington, and Henry Boyd, Jr., Wilmington, N. C., airport manager.
—(SOUTHERN FLIGHT Photos.)

Birds of a feather flock together...for Ryan Navion

AUTHORIZED PARTS & SERVICE

Be Sure — Rely on Ryan-Authorized Navion Service from Coast to Coast

Illinois
HOWARD AVIATION, INC.
Mt. Hawley Airport
Peoria, Illinois

Louisiana
LOUISIANA AIRCRAFT
Municipal Airport
Baton Rouge, Louisiana

Minnesota
VAN'S AIR SERVICE, INC.
Whitney Memorial Airport
St. Cloud, Minnesota

New Jersey
MALLARD AIR SERVICE, INC.
Teterboro Air Terminal
Teterboro, New Jersey

New York
BUFFALO AERO. CORP.
Hangar 1, Buffalo Airport
Buffalo, New York

Texas
GENERAL AERONAUTICS, INC.
Meacham Field
Fort Worth, Texas

Washington and Alaska
WASHINGTON AIRCRAFT & TRANSPORT CORP.
Boeing Field
Seattle, Washington

Mexico
MORGAN & WALTZ, SUCS., S.A.
Monterrey 101-410
Mexico City, Mexico

Puerto Rico
DORADO AIRFIELD
Dorado, Puerto Rico
(Branch Off.: International Terminal, San Juan)

NORTH, SOUTH, EAST OR WEST . . . . the sign **RYAN NAVION AUTHORIZED PARTS & SERVICE** always means dependable service for your Navion.

That is why so many Navions can be found parked on the ramps of the sales and service companies listed.

These Navion owners have learned that there is no guarantee to equal the sign of **RYAN NAVION AUTHORIZED PARTS & SERVICE.**

NOW...*The Better-than-Ever* SUPER 260 NAVION *for* '51

Want the performance thrill of your life? Fly the new, better-than-ever Super 260 *Navion* for 1951! Feel the surging power of the 260-hp Lycoming engine... relax while the *exclusive* inter-connected control system practically flies the 170-mph *Navion* for you. Yes, flying's more fun in the new Super 260 *Navion*. It outcruises, outclimbs, yet lands shorter than other planes in its class. And, for '51—look at these brand new features:

- **NEW...** *More Beautiful Interior Styling*

  Luxurious interiors styled by Charles of California. Beautiful, harmonious colors and fabrics with generous leather trim. Upholstery is extra-thick foam rubber. And the new "reverse flow" ventilating system brings plenty of bracing fresh air into the comfortable, roomy cabin.

- **NEW...** *Exterior Baggage Door*

  The new *Navion Luggage Master* makes baggage a cinch to load and unload. No need to climb in and out of plane while loading... do it all from the outside. Luggage Master is equipped with a sturdy lock for complete protection. Folding rear seat affords easy access to baggage in flight.

- **NEW...** All metal selective pitch Hartzell propeller... push-button starter on the dash board... beautiful, new two-tone exterior enamel finishes... sun-visors and curtains for pilot and passengers.

Ryan Navion

NO OTHER PLANE COMBINES SO MANY FEATURES SO WELL

Rely on Ryan RYAN AERONAUTICAL COMPANY, 611 LINDBERGH FIELD, SAN DIEGO, CALIFORNIA

PARATROOPERS DROPPED FROM 90 FAIRCHILD C-119 PACKETS over North Korea last month. Here are the first five jumpers leaving a C-119 in training maneuvers. The big Fairchilds are not only used by the 11th Airborne Division in Korea but also for transporting men, weapons and supplies to U. N. troops in forward combat zones as well as between Japan and Korea.

—(Fairchild Photo.)

MARTIN 404 FLIGHT TESTS HAVE STARTED at Baltimore. The 404 will gross 42,750 lbs., have a 10,205-lb. payload including 40 passengers, and will be powered by two 2,400-hp. Pratt & Whitney R-2800-CB-16 engines. Top speed will be 312 mph. Glenn L. Martin Co. is building 75 of the airliners, 40 for TWA and 35 for Eastern. A military version is also under way.

—(Glenn L. Martin Photo.)

AIR REPORT

(Continued from page 7)

carry its dispensing equipment for dust or spray inside the wing.

SUBCONTRACTING FOR BOEING B-47 PRODUCTION is all wrapped up, according to Boeing, with subcontracts already issued for 100 per cent production on current orders. . . . **FIRST SUPERSONIC PROPELLERS** may be revealed as giant Curtiss props which are standard on B-36's. It is known that under certain conditions frequently encountered in B-36 operations, its propeller tips exceed the speed of sound with nothing out of the ordinary happening. . . . **WAYS TO COMBAT CREW FATIGUE IN B-36** are being studied. Crews frequently are flying 40-hr. hitches in the intercontinental bombers, posing fatigue and other personnel problems.

SELECTION OF FIRST SCHOOLS FOR CIVILIAN CONTRACT FLIGHT TRAINING was made by the USAF Air Training Command last month

Feeder Facts and Figures

PROTOTYPE DEVELOPMENT OF A SHORT-HAUL PASSENGER TRANSPORT WITH U. S. ASSISTANCE is needed and will be sought, said Del Rentzel, new CAB chairman, at 1950 Airport Management Conference in Oklahoma. "I am convinced we need air service in every community that can possibly justify it, but I am also convinced it won't be economically sound until we can get an airplane that will fly economically enough to make it pay off," he said. "Prototype legislation passed in the closing days of Congress provides the basis to work with. We will try to do what we can to get the feeder airline people the kind of airplane they think they should have.

HERE'S KIND OF TRANSPORT FEEDER OPERATORS WANT: Direct operating costs, 35 cents per mile; payload, 24 passengers, or at least 5,250 lbs.; speed and range, about 275 mph. and 350-550-mile range; special characteristics, certificated for 3,300-ft. runway at sea level, and pressurized cabin. Manufacturers will be asked to consider these specifications.

FOUR DC-3 SCHEDULES DAILY REPLACING SINGLE-ENGINE SERVICE on some Central Airlines' runs were inaugurated November 9. The Douglases are 24-passenger types, with built-in ramp. . . . **WISCONSIN CENTRAL PLANS TO REPLACE LOCKHEED ELECTRAS WITH DC-3 EQUIPMENT.** We rode a WIS Electra from Milwaukee to Chicago last month, lucky to get a seat after 14 persons had been turned down at the counter. They all left, disgruntled, but we hung around, anxious to get home to Dallas. Sure enough, somebody failed to show and we got aboard. . . . **A FIRST-YEAR RECORD OF 1,339,018 SCHEDULED MILES FLOWN IN SINGLE-ENGINE CESSNAS WITHOUT INCIDENT** has been made by Mid-West Airlines. Passengers carried total 6,007 and airmail totals 206,473 lbs. Average passenger trip has been 146 miles. MWA's system consists of 1,257 miles requiring over 5,000 miles of scheduled flying daily. First-year performance factor was 85.51 per cent. . . . **ALL AMERICAN AIRWAYS** in 20 months has flown over 190,000 passengers between 45 cities on its system to establish a new record for local service airlines.

BREAK-EVEN MAIL PAY HAS BEEN CUT FROM 23 CENTS PER MILE LAST MAY TO 11 CENTS IN AUGUST by Southwest Airways, which carried 12,896 passengers for a system load factor of 57 per cent during the month. Break-even need for six months ended in October was calculated to average only 18 cents per mile.

AUGUST WAS BEST MONTH YET FOR LOCAL SERVICE AIRLINE INDUSTRY, according to Ray & Ray, consultants. The average break-even need for all of the seven DC-3 operators which have been flying two years or more was 29.75 cents per mile. These same carriers flew approximately 1.5 million miles at a cost of 78.8 cents per mile. Non-mail revenue was 49.05 cents, giving the figure of 29.75 cents for the break-even need.

FLYING BUSINESSMAN - OF - THE - YEAR will win this gold trophy to be awarded by Ryan Aeronautical Co. to the Navion owner logging the greatest number of hours during the 12-month period beginning Nov. 1, 1950. The girl? She's Elizabeth Shea of San Diego, who held the handsome trophy for the photographer.

—(Ryan Photo.)

and was to have been announced, but disclosure of contractors was postponed. . . . **RESULTS OF USAF TRAINER EVALUATION** have been expected momentarily for almost two months. Choice is expected to be between Beech YT-34 and Temco YT-35. Same trainer will be used for USAF and Navy, with large quantity purchase anticipated.

Airmen's Calendar

Nov. 29-Dec. 1 — ADMA Annual Meeting, Ambassador Hotel, Los Angeles, Calif.

Nov. 28-30 — Airport Fire Safety Clinic, sponsored by National Fire Protection Association, Committee on Aviation and Airport Fire Protection, Baker Hotel, Dallas, Texas.

Dec. 16—Fourteenth Wright Brothers Lecture, IAS, U. S. Chamber of Commerce Auditorium, Washington, D. C.

Jan. 6-7—Miami Air Show and Races, sponsored by Florida Air Pilots Association, Opa-Locka Airport, Miami, Fla.

Jan. 8-10—Miami-Havana Air Cruise for Lightplanes.

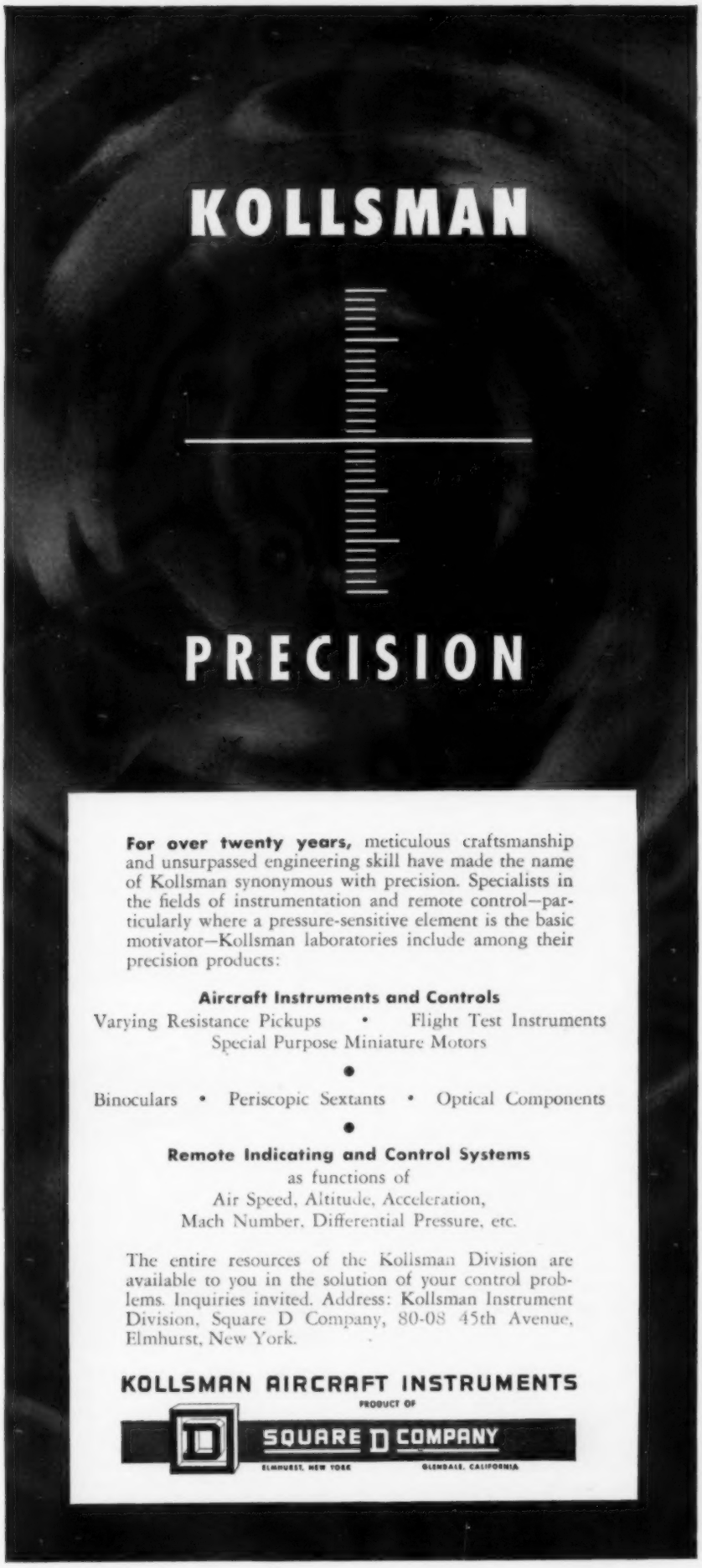
VETERAN PILOTS

(Continued from page 27)

the war in the Pacific as a plane commander in PB4Y's and Liberators, coming home with three DFC's and 8 Air Medals. Out of the Navy in 1946, Wilbur organized Central American Airways, a charter airline which began with non-scheduled flights between New York, Puerto Rico and other points. He now operates his own flight school and charter service in Louisville and at 28 has 6,000 hrs.

RUSSELL J. WRIGHT soloed in 1935 at Pittsburgh-Bettis Airport, becoming employed by Pennsylvania Central Airlines (now Capital) in 1938, and being checked out by PCA as a captain in 1941. Called to active duty as USAF second lieutenant in 1942, he was based at Hamilton Field with Project 32, ferrying B-17's to Australia and ferrying into the Middle East and India. He was based overseas in South Atlantic ATC from 1942-45, separating as a lieutenant-colonel and re-joining Capital, for which he is now flying.

The well-known author and writer, JOHN R. HOYT, is a VAP member who started flying as a USNR aviation cadet in 1935. After serving as a pilot aboard the USS Lexington during 1936-39, he was a CAA inspector in 1940, a Navy flight instructor in 1941. His "Manual for Aviation Cadets" and "Safety After Solo" were published by McGraw-Hill during the war and he was commissioned a commander, USNR, in 1945. Hoyt was a CAA agent in the 6th Region during 1947-50 and is president of Jayarr Productions, Inc., of Los Angeles, his home. He has 5,000 hrs. ★ ★ ★


KOLLSMAN
PRECISION
For over twenty years, meticulous craftsmanship and unsurpassed engineering skill have made the name of Kollsman synonymous with precision. Specialists in the fields of instrumentation and remote control—particularly where a pressure-sensitive element is the basic motivator—Kollsman laboratories include among their precision products:
Aircraft Instruments and Controls
Varying Resistance Pickups • Flight Test Instruments
Special Purpose Miniature Motors
Binoculars • Periscopic Sextants • Optical Components
Remote Indicating and Control Systems
as functions of
Air Speed, Altitude, Acceleration,
Mach Number, Differential Pressure, etc.
The entire resources of the Kollsman Division are available to you in the solution of your control problems. Inquiries invited. Address: Kollsman Instrument Division, Square D Company, 80-08 45th Avenue, Elmhurst, New York.
KOLLSMAN AIRCRAFT INSTRUMENTS
PRODUCT OF
SQUARE D COMPANY
ELMHURST, NEW YORK
GLENDALE, CALIFORNIA

Questions and Answers For Airport Operators

Preparing an Operating Budget

QUESTION:

Every year, along about this time, we are required to prepare a budget for our municipal airport for the coming calendar year. We really sweat it out. I get some figures together with the help of my assistant manager and the city clerk. We guess at the amounts which we think will be needed, as closely and as honestly as we can, and then the airport budget is submitted to the city council for approval. Some years we get what we ask for, and some years we don't. In either case, however, the preparation of the budget is always a big headache. We dread to see this time of the year arrive. There must be some easier and better way of estimating our budgetary requirements than the one which we are following. Do you have any suggestions to offer?

ANSWER:

We agree with you that there is a better way of preparing budgets than the one which you have been following. However, you are not in this boat by yourself. In our opinion, a large majority of all department heads and other operating officials who prepare budgets go about the job backwards. That is to say, they begin by trying to guess (or "estimate", if you like that word better) how much money will be required for various functions, or for different parts of their organization. This method begins with guessing and frequently ends with grief.

Actually, a budget is a work program expressed in money values. This being so, if one is to prepare a budget, the best way to begin is to forget the budget, as such, and think about the work program. Think about it in generalities, and then think further into its details. Select and fix upon specific objectives which it is desired to accomplish. Decide what actual work there is to be done; then determine how many people and what types of employes will be required to accomplish that work. Will all of them be required for a full year, or may some of them be employed on a part-time basis or for some portion of the year?

Think of those things which will be required which are of a non-routine nature. For instance, it may be that a large building will need painting during the coming year. Will the job be done by contract or will it be accomplished with payroll labor? If it is to be done by contract, then a reasonably good estimate should be secured from a painting contractor. If it is to be accomplished by payroll labor, then a reasonably accurate estimate must be made as to the quantities of both labor and paint which will be required.

One of the best airport managers we know was faced with this situation when planning his work program for 1950. The painting to be done was a very sizeable job; yet, the amount which he included in his budget for this item was surprisingly small. When asked about it, he explained that he intended to accomplish the painting by using one of his regular payroll laborers and having him spend one-half of his time on the work over a period of several months. In this way, therefore, the only cost of the painting, over and above his regular expenses, would be the cost of the paint itself. The work is now finished and it was accomplished within the amount which he had provided in his budget.

The point of this story is that this man, being an exceptionally competent manager, prepared his budget in three logical steps. He planned for the specific item and included it in his work program. He determined in advance how the work was to be accomplished and made a reasonably accurate estimate of its cost. He included the cost in his budget estimate, and thus had a budget which represented a concrete program presented on a factual basis.

When an entire work program has been well thought out and carefully planned, the preparation of the budget itself becomes a very simple matter. Any good clerk will be able to substitute the money values for the work program and prepare the budget in the form required.

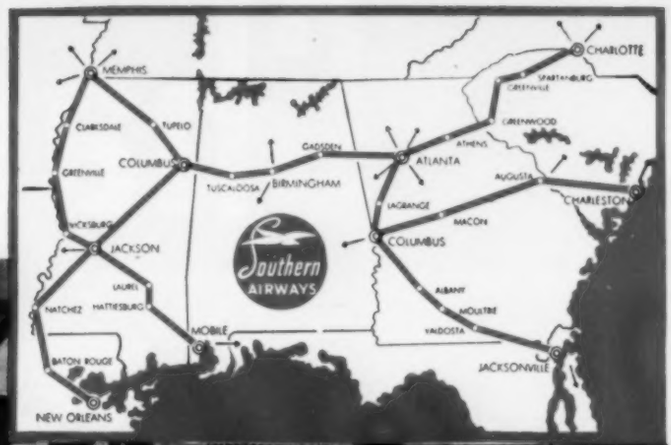
Unforeseen and unplanned-for items will frequently occur in any airport's operation. If amounts for such things are to be included in the budget, however, they should be labeled by their true name, "contingencies", and not be buried in other items. In reviewing a budget estimate, a city council can either approve the allowances for contingencies, or reject the request, preferring to appropriate specifically for the contingencies at such times as they arise.

A budget which has been prepared and submitted on such a factual basis usually receives the consideration which it deserves from the city council. Members of the council need not try to outguess the airport manager regarding the amounts of money which are justified. To slice arbitrary amounts from such a budget would be both unwise and unfair. If economic circumstances require a reduction in the amount requested, councilmen can give the matter the consideration and careful analysis which such a question justifies, and select specific items which are to be deferred or omitted from the work program. Such a policy represents good city management. It has been our observation that those airport managers who prepare and submit their budgets on such a realistic basis usually turn out to be the ones who are allowed to manage their airports with the least interference,

(Continued on page 37)

OLD BUT STILL A TOP PERFORMER IN ITS LINE, this Travel Air 2,000 was photographed at Beech Aircraft's factory field recently when its pilot, Emmett B. Turner, crop duster of Greeley, Colorado, dropped in for gas en route to a dusting job at nearby Russell, Kansas. Being as how the Travel Air was built by Beech over 20 years ago, somebody rolled a new painted Bonanza up and took a picture. Turner told them the old 2,000 has over 13,000 hrs., including 2,500 hrs. of his personal flying during which he scattered some million pounds or so of dust on sugar beets and beans. It has a 220 Continental instead of the original OX5. Two other Travel Air dusters operate out of Greeley with it. Travel Airs are still valuable, many operators considering them still tops in aerial cropping because of their excellent handling characteristics.
—(Beech Aircraft Photo.)

SOUTHERN AIRWAYS Commutation Service links 30 cities in the Southeast with sleek, Texaco-lubricated DC-3's. Under this system, passengers can spend a business day in any city on Southern's system and return by plane to the point of departure at the end of the day.



SOUTHERN AIRWAYS OFFERS COMMUTING SERVICE

Texaco helps assure dependable, economical operation

Southern Airways has already logged more than 6½ million passenger miles in the operation of the only local air service in the Southeast. Maintenance of dependable schedules is of prime importance, so dependable engine operation is a "must." That is why Southern lubricates its DC-3's with *Texaco Aircraft Engine Oil* exclusively.

In this choice, Southern Airways is in the good company of leading airlines everywhere. In fact—

More revenue airline miles in the U. S. are flown with Texaco Aircraft Engine Oil than with any other brand.

Texaco Aviation Products and Lubrication Engineering Service are famous for producing high efficiency and reducing costs. Let a Texaco Aviation Representative help you gain these benefits for your operation. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, *Aviation Division,* 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Lubricants and Fuels

FOR THE AVIATION INDUSTRY

TUNE IN . . . TEXACO STAR THEATER starring **MILTON BERLE** on television every Tuesday night. See newspaper for time and station.

A Change

North, East, South, West—the industry agrees on our change in name. Here are some typical reactions:

"Should have made the change years ago."
—Tom Braniff, Pres., Braniff Airways

"Dropping 'Southern' is something I've long hoped you could do. It should give you the national scope your activities and interests deserve."
—Bill Strohmeier, Vice Pres., Davis-Parsons, Inc.

"Congratulations on the new scope of your magazine implied in the change of title to FLIGHT Magazine."
—Harold Mansfield, Boeing Airplane Company

"FLIGHT Magazine!—That sounds good to me!"
—Phil McKnight, Beech Aircraft Corp.

"Changing the name of your magazine to 'FLIGHT Magazine' will be much more descriptive as I am sure your coverage today is nation-wide if not world-wide."
—Jim Wheeler, Shell Oil Company

"That's really good news about the change in your name from Southern Flight to FLIGHT Magazine."
—Bill Wagner, Ryan Aeronautical Company

"I am pleased to hear of the expansion plans for your magazine."
—J. H. Carmichael, Pres., Capital Airlines

"I think you are making this change at a very opportune time and I'm sure the change will enable you to obtain the national coverage you desire."
—Jake Miller, Piper Aircraft Corporation

Published by

AIR REVIEW PUBLISHING CORPORATION

BOX 750, 1901 McKINNEY AVENUE
DALLAS 1, TEXAS

QUESTIONS AND ANSWERS

(Continued from page 34)

since they enjoy the confidence of the councilmen and other influential city officials.

Uniforms for Service Workers

QUESTION:

On the airport which I manage we have a staff of two maids who take care of the women's lounge and restroom, one on the day shift and one on the early night shift. While their work seems to be satisfactory and the rooms are kept clean, I have had a number of complaints as to the personal appearance of the maids themselves. Would you recommend that they be uniformed?

ANSWER:

Definitely yes. Not only would we suggest that they be put in attractive uniforms but we believe your airport might find it advantageous to supply the uniforms in order that they be of good quality and cut and of attractive, distinctive design. If the maids have at least two or three each, they will have no difficulty in keeping them clean so that they will look fresh as they come on duty each shift. Put the name of the airport and your town in neat script above the pocket so that those who get good service on your airport know that it is your town's airport. In other words, advertise.

We would even go so far as to suggest that your janitors be in plain cotton uniforms with the name of the airport and the town on contrasting color on them. Too many times we see someone cleaning out the ashtrays in an airport terminal when his clothes suggest he might have just cleaned the boiler.

Preventing Vandalism

QUESTION:

Maybe this isn't the kind of question to be asked in your QUESTION and ANSWER Department but it is important enough for me to send it to you anyway. We have five hangers on this field and lately we have had considerable expense replacing window lights. Somebody has been throwing rocks at them. There has been a couple of cases of slight damage to airplanes also because of this. I can't find out who is doing it or why, but the people around the field tell me they think it is being done by boys, but we can't catch them at it.

ANSWER:

You're probably right in thinking that this is not exactly the kind of a problem this column is qualified to handle. We've never had this situation presented before. The only thing we can do is dig deep down in the memory file and come up with this possible solution. A good many years ago we knew the manager of a good sized manufacturing plant who had the same trouble. He knew it was caused by boys in the neighborhood. They weren't bad boys but in a sense they were what are now called "underprivileged" kids who had no playgrounds but the streets and sidewalks of an industrial section.

A policeman who had two boys of his own came up with the answer. He suggested the organization of a Boy Scout troop in the neighborhood and it was organized under the sponsorship of the local precinct police station. The manager of the industrial plant helped out with time and a small contribution and kept up his interest to the extent that he

The ***NAVION LOOK*** You'll find plenty of "get up and go" in the 1950 Ryan *Navions*. The Super 260 gets off in 400 feet...clears a 50-foot obstacle in 770 feet.

WHEREVER YOU **GO**
WHATEVER YOU **FLY**

ARC

THERE IS
ARC EQUIPMENT
TO MEET YOUR
OPERATIONAL NEEDS

VHF COMMUNICATION and LF NAVIGATION SYSTEMS

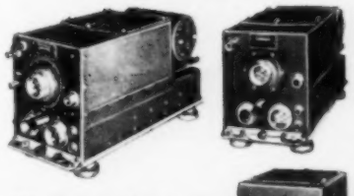
THE ARC TYPE 11A

Meets your basic navigation and communication needs. Provides for VHF transmission, LF range reception and rotatable loop navigation.

THE ARC TYPE 17

Adds two-way VHF communication. System includes tunable VHF receiver and a five-channel, crystal controlled VHF transmitter. As many as four of these transmitters may be installed providing up to 20 channels.

THE ARC TYPE 12



Gives you the combined advantages of the type 11A and the Type 17 systems. You get two-way VHF communication and LF range reception, as well as rotatable loop navigation.

Ask about ARC Type 15B Omnirange equipment and ARC's 10-channel Type F11 Isolation Amplifier. Write for all the details.

All units of these systems are type certificated by the CAA. Installations for both single and multi-engine planes are made only by authorized agencies.

ARC

AIRCRAFT RADIO CORPORATION
Boonton New Jersey
Dependable Electronic Equipment Since 1928

ONLY
CONTINENTAL MOTORS CAN OFFER ALL THIS!

When you avail yourself of Continental Motors' Remanufactured Engine Plan, you get values obtainable *nowhere else:*

YOU GET

↓

Completely modernized engine, embodying every engineering refinement found in current production. In the C145, for instance, these include latest type dynamic damper crankshaft, through-bolt crankcase, forged steel camshaft, cast cam-followers and all other late modifications; in the E185 it also includes newest oil-pump gears, hardened oil-pump drive-gear shaft, and other oiling system features providing greater output—plus a 205-h.p. take-off rating.

YOU GET

↓

Complete accessory equipment, tested and matched to the engine on which they are installed. This includes magnetos, wiring harness, spark plugs, carburetor, oil sump—and on models having provision for them, starter and generator also.

YOU GET

↓

New engine warranty and new zero-hour engine log book, which, like the items above, can be had only on engines remanufactured by the factory itself.

FOR SAFETY—FOR ECONOMY —FOR SATISFACTION—

SEE YOUR

CONTINENTAL DEALER

Continental Motors Corporation

AIRCRAFT ENGINE DIVISION

MUSKEGON, MICHIGAN

saw to it each year that one or two of the kids from the poorest families got to go to Scout Camp. The depredations stopped almost over night. That sounds like a fairy story but it is true.

It leads to a few other ideas, too. Why wouldn't it be smart to organize a Boy Scout troop under the sponsorship of an airport? Include the boys whose parents are in the personnel of the airport and those who live within convenient range of the airport. Don't organize it just to save your windows. Let it be a good advertisement of the civic pride of the airport in its community. Let it be a means of building up public acceptance and consciousness among the parents of the boys. Think of the pride those Scouts will have in helping out in airport celebrations and shows that bring crowds to the airport.

BOEING NOW EMPLOYS 20,000 WORKERS IN SEATTLE AND OVER 11,700 IN WICHITA and is producing increased orders for C-97 Stratofreighters and B-50 bombers in Seattle and B-47 jet bombers in Wichita.

NAUTICAL MILES AND KNOTS will replace statute miles and miles-per-hour in all CAA communications with aircraft after July 1, 1952. Uniformity is needed because U. S. military and civil agencies are now developing an air navigation system to be used in common by all aircraft. U. S. Military forces adopted nautical miles and knots as standards in 1946. Air speed indicators and other instruments can be converted by substituting a new dial. A nautical mile is 6,080 ft. and 33 nautical miles equal 38 statute miles. Basically, a nautical mile is one minute of arc on a great circle. Knots are the number of nautical miles traveled in an hour—91 miles per hour equals 79 knots, for example.

NAVION DISTRIBUTORSHIP FOR NORTHERN WYOMING AND MONTANA has been announced by Rocky Mountain Air Service, operators of Cody (Wyo.) Municipal Airport and subsidiary of General Aeronautics of Meacham Field, Ft. Worth, Texas, Navion distributors. Les Bowman, president, says Cody got its first ground-covering snowfall last month. Runways will be kept open during Winter.

PRECISION CASTING OF MAGNESIUM AIRCRAFT WINGS is being studied by Northrop Aircraft, which in 1943 produced the XP-56 as the world's first all-magnesium (sheet metal) airplane and which has cast from magnesium the center wing section of experimental buzz bombs.

PIONEER 'CHUTES
Preferred **for**
high speed jet planes

The ULTRA in parachute design is embodied in the P3-B . . . lightweight, soft, compact and flexible. Equipped with the fool-proof, foul-proof, pilot 'chute and the Pioneer Quick-Fit Harness* which enables the wearer, regardless of size or weight, to adjust the harness to a perfect fit in less than 3 seconds.

The P3-B is preferred by test pilots and aviation manufacturers, and *is* standard with many government air forces the world over.

*PATENTS APPLIED FOR IN U.S. AND ALL PRINCIPAL COUNTRIES THROUGHOUT THE WORLD

PIONEER PARACHUTE COMPANY, INC.
Manchester, Conn.

A DECADE OF PROGRESS

Southwest Factory Branch
Love Field
Dallas, Texas

AUTOPILOT

(Continued from page 25)

There followed Lear inventions almost countless in number. His company produced millions of dollars worth of accessories during the war. These included a unique Lear invention, the "Fastop" clutch, the heart of electro-mechanical actuators which became widely used in aircraft.

Thousands of private fliers know the name of Lear because of the portable radio he made famous. After the war, his aircraft radio sets and VHF equipment, including the now-famous Omniscope, made history in radio communications and navigation, as did his lightweight, low-cost ADF, now widely used.

The airplanes Lear flies always attract the curious around airports, for everybody knows there's something new inside when Bill arrives. The latest is a 16-in. television set he installed in the cabin of his Lodestar. On our recent junket with him, we enjoyed the first and finest TV pictures ever seen while cruising at 7,500 ft. Up front, the Lodestar had Lear's new miniature autopilot — complete with automatic approach control and altitude control. These two units are now available to purchasers of the L-2. He had also installed on the Lodestar panel completely dual ADF indicators and Omniscopes, along with dual Lear VHF receivers and transmitters. So small is all this equipment that there was still room left on the panel for complete instrumentation — there were even some blank spaces.

Arriving at Grand Rapids, Lear busily engaged himself in at least two dozen different projects, being all over the service hangar at the airport and the factory and laboratory downtown. One of the busiest spots was his new gyroscope laboratory, where history is being made in a quiet way. Some of the projects involving his attention are restricted military undertakings. Among these is guided missile activity.

Big as is the busy man's past, his future is potentially tremendous, considering the scope of his research and manufacturing. As for the L-2, it is only one of many significant Lear activities which will influence aviation progress. There are others and the sum total indicates that William Powell Lear's contributions to aviation advancement will inevitably bring to him aviation's topmost honors, not to mention manufacturing and financial success on the grand scale.

★ ★ ★

The First and Foremost Metal Propeller for Personal Planes

MET-L-PROP
For the life of your plane!

No more warping or splitting, no adjustments, maintenance or tipping, no weather worries, no leaky oil lines or levers to turn . . . just a shorter take-off, faster climb and smoother cruise. Met-L-Prop is scientifically built of forged aluminum to last the life of your plane. Write for folder.

McCAULEY CORPORATION
1840 Howell Ave., Dayton 7, Ohio

Aircraft Sales Company

MEACHAM FIELD
FORT WORTH, TEXAS

A PIONEER DISTRIBUTOR OF NARCO EQUIPMENT AND LEADER IN RADIO INSTALLATION AND SERVICE IN THE SOUTHWEST

Takes Pride in

Introducing the New narco Omnigator!

(Model VTR-1)

- Improved receiver, tunable 108 to 126.5 mc.
- New 8 channel transmitter
- Standard instrumentation for omni VAR phase and tone localizer
- Sensitive marker, 75 mc.
- Simpler installation—improved service
- Total weight only 18½ lbs.
- Increased loud speaker output
- Controls and instruments indirectly lighted

Let Our Staff with Years of NARCO Experience Demonstrate This Remarkable New NARCO to You.

AIRCRAFT SALES Company
MEACHAM FIELD FORT WORTH 6, TEXAS

No. 21 in a Series Advt.

Fly the Weather

. . . plan now to be ready

WITH WINTER'S WORST AHEAD, now is the time for pilots to plan for weather flying by selecting and installing adequate radio aids for communications and navigation.

NEW AND BETTER VHF EQUIPMENT has been developed since last Fall and there are numerous ways to improve or modify your old equipment. The best approach is to drop in at our Love Field headquarters and let us run a check on your cockpit. And while you're here we can brief you on all the new developments you may or may not have looked into.

A CURE FOR WEAK GLIDE SLOPE SIGNALS is now available, for example. It is the new Collins antenna—a very small, common-sense antenna which we install on the front of the nose, down where it can receive signals out in the clear. Old-style slide slope antennae (they're the horizontal whiskers on the ram's horn) just haven't proved practical. This new little Collins antenna receives signals miles farther out from the marker.

FOR BETTER FLYING THIS WINTER, these and many other aids for weather flying are now available. We're equipped to give you the latest information and schedule your installation for guaranteed satisfaction.

Distributors for

★ COLLINS ★ LEAR

Dealers for

★ ARC ★ BENDIX

★ VHF AVIGATOR

Associated Radio

CARL FOX
TONY AGUILAR
LEE LANFORD

LOVE FIELD • DALLAS

PRECISION . . .

In the Rebuilding of Aircraft Engines and Engine Accessories Is Essential to a Good Reputation. Our Customers Have Proven the Reliability of Engines and Accessories Rebuilt by . . .

PRECISION AEROMOTIVE

CORPORATION

MUNICIPAL AIRPORT —MIlby-6636— HOUSTON 17, TEXAS

PUSHER

(Continued from page 16)

easy to fly, stable and offers visibility surpassed only by rotary wing craft.

Such a design should find acceptance in all sorts of patrol work—power line, forest, pipe line, irrigation, agriculture, etc. The amazing visibility built into the 14 precludes any chance of hitting any obstructions while hedgehopping. Hence crop dusting and spraying versions are in the realm of probable adaptations. Ranches and large farming operations especially could use what the 14 has to offer.

Military officials charged with liaison developmental programs might well investigate possible adaptations of the basic versatile AG-14 design which can be easily converted into a larger airplane with more power. The 14 pusher offers definite advantages impossible with conventional tractor designs.

Although the 14 is the first design Anderson Greenwood has actually perfected and completed, it is not their first excursion into the lightplane field. Before the war the three principals of the company, Ben M. Anderson, Marvin H. Greenwood and Lomis Slaughter, Jr., designed a low wing tandem job (AG 11), powered by an 80-hp. Continental, with retractable gear and a canopy. They also designed a 90-hp. single-seater which would do 180 mph. That was the AG-12. AG-13 was a helicopter study.

All three spent the five major war years at Boeing, Seattle, in the engineering department. They departed from Boeing in 1945 to start again where they left off in Houston back in 1940. Preliminary design work on the 14 was begun in 1946. From 8 to 10 men, including the three principals, have been at work full time on the project.

Perhaps preparations for war will interfere materially with their hopes to produce for the civilian aircraft market. But if it does, we believe these three young Houstonians will be heard from in the days to come and should they be fortunate enough to proceed uninterrupted by a defense economy, you'll be hearing from these gentlemen. Theirs is the kind of effort, ingenuity, perseverance, inventiveness and engineering know-how which has made our nation the only one in the world to aggressively develop the airplane for productive peacetime pursuits. ★ ★ ★

Costello Island INC.

For Something to Do Besides Fly

★ Land on our island's three airstrips and enjoy famous Possum Kingdom Lake. . . . Located 60 miles west of Fort Worth. ★ Completely modern duplex cottages, tastefully decorated and furnished. . . . Innerspring Mattresses and large brick fireplaces in each unit. ★ Dining room with country club style steaks and chicken dinners at reasonable prices. ★ Bass, Blue Gill, Crappie. . . . Duck and Deer Hunting in season. . . . Metal Boats with Outboards. . . . Daily and weekly rates. . . . Bring your family, friends or flight parties.

Costello Island, Inc.

"For the Discriminating"

60 Miles W. of Ft. Worth Tel. Possum Kingdom 19F2 Graford, Texas

E. BEDFORD JONES, Operator

INTERSTATE AIRCREDIT CORPORATION

First in Aircraft Financing

MUNICIPAL AIRPORT
MINNEAPOLIS, MINN.

Telephone: PARKER 7071
H. A. SHAFFER, President

JUST AMONG OURSELVES

(Continued from page 9)

Thus the emphasis should remain on long-range strategic air power, properly equipped, trained and maintained to achieve air supremacy in the shortest possible time.

DESERVED RECOGNITION

IF you want to be critical it's easy to complain that each year far too many awards and honors are given our so-called aviation great, lessening the impact of deserving awards to those who have made truly great contributions to aviation. Because of this condition a lot of people might have missed the tribute paid last month in New York to a man by the name of Harry Bruno, who was awarded the William A. McGough Memorial Award for outstanding service in aviation at a dinner given by American Legion Air Service Post 501. We think Harry Bruno deserves the award and all of the nice things said about him at the testimonial dinner by such great contemporaries as Igor Sikorsky, Alexander P. de Seversky, Admiral Charles E. Rosendahl, General Hoyt Vandenberg, Admiral John Towers and General George Stratemeyer.

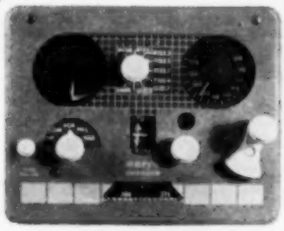
Bruno was first heard from when he built and flew the world's smallest monoplane glider at Montclair, New Jersey, in 1910. At the tender age of seventeen he was a pilot in the U. S. Aeronautical Reserve and flew with the Canadians during World War I. In 1921 he made the first circumnavigation of the Great Lakes in a flying boat. He is one of the three living founders of Quiet Birdmen.

After a successful career as a newspaperman, Bruno entered public relations, the field in which he has accomplished so much for aviation. The list of people he has represented on famous flights reads like an aviation "Who's Who"—Lindbergh, Byrd, Sir Hubert Wilkins, Lincoln Ellsworth, Wiley Post and Harold Gatty—just to name a few.

Harry Bruno is unequivocably the dean of aviation public relations men. Recognition of his good work is also recognition of the value of sound public relations to the development of aviation—an art, science and profession that never has had the recognition it deserves.

★ ★ ★

THE narco Omnigator



Model VTR-1

NEW OMNIGATOR is VHF at its very best! With all 7 VHF units in one richly styled panel, it only weighs 18½ lbs. The complete system includes omni, two-way VHF radio, localizer, power supply & marker. INVESTIGATE AND FLIGHT TEST TODAY!

narco
NATIONAL AERONAUTICAL CORPORATION
WINGS FIELD, AMBLER, PA.

TULSA.....

The Oil Capital of the World

Invites You to Land at Tulsa Municipal Airport

THE AIRPORT OF TOMORROW — TODAY

- Unlimited Hangar Space
- Streamlined Fueling Systems
- Paved Runways
- Restaurants

Tulsa Municipal Airport
C. W. SHORT, JR., Mgr.
Tulsa, Oklahoma

- Transportation
- Complete Weather Information
- Control Tower
- Maintenance Facilities

"Ask Your Fixed Base Operator to Inspect Your Aircraft for Insurance Savings"

NATIONAL INSURANCE UNDERWRITERS

34 N. Brentwood Blvd. St. Louis 5, Missouri Phone Delmar 7878

SERVICE GUIDE FOR FLIERS —

WHERE to STOP

TENNESSEE

DIXIE AIR ASSOCIATES INC.
Memphis, Tennessee

Superior in aircraft transit service, hotel reservations. Rental autos available all times. No tax on gas, no landing fees, 24 hour service and restaurant. Clean rest rooms. Class IV field, Esso Aviation Products. Located on Municipal Airport.

HERTZ DRIV-UR-SELF SYSTEM LICENSEE

TEXAS

IN SAN ANTONIO . . . IT'S ALAMO AIR LINE SERVICES

On San Antonio Municipal Airport transient pilots who want the best in prompt and efficient service always stop with Alamo Air Line Services, Inc.

Texaco Products — Storage — Tie-Down

Next time you're down our way, drop in!

Free Transportation to and from Terminal Bldg.

24-Hour Charter Service Telephone Travis 2649

Flying's Swell at the FLYING L

An adventure in real Western life for all the family . . . Superb food . . . Hunting . . . Fishing . . . Horseback riding . . . Cozy-comfort guest suites. Located at Bandera, 32 miles West of San Antonio.

WYOMING

STOP AT CODY — **WYOMING'S AIR GATEWAY TO THE NORTHWEST AND CANADA**

Lighted, blacktop runways for all plane types open year-round. . . . Beacon. . . . Licensed mechanics, repairs, parts, storage. . . . Texaco aviation fuel and oil. . . . Courteous, fast service.

Excellent airport restaurant, Hertz Rent-A-Car, big game hunting and fishing arrangements, reservations for hotel, tourist court or dude ranch. ROCKY MOUNTAIN AIR SERVICE, Ted Royse, Manager, operators of Cody Municipal Airport, Cody, Wyoming.

Bellanca...

Tops in cruising speed, rate of climb, useful load, range and structural strength.

Get the most cruising speed for the lowest initial cost. Also lowest operational cost per mile.

Available for immediate delivery.

Luscombe...

The new Luscombe Silvaire Model 8 is the operator's airplane. New improvements such as the "package" instrument panel with Dzus fasteners and the swing-out engine mount to facilitate maintenance will keep costs down.

New flap control permits flight speeds under 40 mph.

• • •

Now is a good time to trade in your old equipment for new.

•

Trade-in and financing arranged
Authorized Sales & Service

•

Weatherly-Campbell Aircraft Co.

Highland Park Airport **Route 7**
Phone: EMerson-1573 **Dallas, Texas**

CLASSIFIED ADVERTISING

SOUTHERN FLIGHT'S CLASSIFIED ADVERTISING RATES ARE 5c per word (minimum rate $2)

BOOKS

AVIATION BOOKS BY CHARLES A. ZWENG prepare you for your rating. These outstanding texts lead the field; frequent revision protect you with latest authentic "multiple choice and map examinations" with new material not available elsewhere. There is a text for each rating, viz: Flight Instructor $3.50; Aeronautical Training (Private & Commercial) $3.50; Meteorology for Airmen $3.00; Airline Transport Pilot $4.00; Flight Engineer $4.00; Aircraft Dispatcher $4.00; Link Instructor $4.00; Aircraft & Engine Mechanic $3.00; Radio and Instrument Flying $4.00; Practical Manual of the E6B Computer $2.50; Parachute Technician $3.00; Flight Instructor Oral Examination $1.00; Airport Operation and Management $4.50; Zweng Aviation Dictionary $6.00; Flying the Omnirange $4.00. (Free Catalog). Pan American Navigation Service, 12021-27 Ventura Blvd., N. Hollywood, Calif.

BONANZA

Beech Bonanza. 350 hours. Just Relicensed. D. A. Clem, 123 Laura, Wichita, Kansas. Phone 4-5012.

Bonanza N422B. Serial 1429. Painted. Extra Fuel Tank. Attitude and directional gyro. Window curtains and seatcovers. Plastic propeller. Total Time A & E 460. Top Condition. $7000. J. Hudson. Route 7, Highland Park Airport, Dallas, Texas. EMerson-2885.

N3006V. Airframe 840 hr. Engine 286 since zero time. $5500. Also 2 other clean Bonanzas $6000 each. J. Hudson, Route 7, Highland Park Airport, Dallas, Texas. EMerson-2885.

CESSNA

1948 Cessna 140. 90-hp. 2-way radio. Privately owned since new. Will take trade-in. $1,950. J. Hudson, Route 7, Highland Park Airport, Dallas, Texas. EMerson-2885.

STINSON

1948 Stinson Station Wagon. Company owned and maintained. Regloed. Sensenich Two Position Sky blade. Complete advanced gyro panel. 675 hours. Uses no oil. March 1950 license. Will deliver within U.S.A. Price $2975. Write States Exploration Company, Sherman, Texas.

AIRPLANES

Send for Free List
World's largest stock personal and light commercial.
Lowest Prices — Domestic and Export.
We do everything except pay for your plane.
Be thrifty in 1950!
Dealers write for Dealer discount setup.
VEST AIRCRAFT CO. WHOLESALE
Field and Offices: Box 38, Capitol Hill Sta.
Denver, Colorado

WANTED: Fixed-base Operator. City of 35,000, with air line service, desires a good operator for its municipal airport. Close-in location. Near large Army post. Facilities include one metal hanger 80 x 100 and office space. Operator will have exclusive gasoline privileges. Inquiries invited. Write Mr. F. Shelby Collum, Chairman, Fayetteville Airport Commission, c/o Branch Banking and Trust Company, Fayetteville, N. C.

We Buy and Sell Airplanes

Highland Park Airport, Inc.

EM erson-2885
EM erson-6907

Rt. 7, Dallas, Texas

THE HUMBLE ESSO WINGS

Promise Fine Service to Match Fine Products

At any one of these 72 Humble-Esso dealers you'll find aviation products unsurpassed in quality. You'll also find the kind of competent, friendly service you've learned to expect everywhere you see the Humble sign.

Wherever business or pleasure takes you along the skyways of Texas, you'll find Humble-Esso wings to invite you in for careful service and aviation products that are first with flyers in Texas.

HUMBLE OIL & REFINING COMPANY

DEALER	TOWN
City of Abilene	Abilene
Lone Star Flying Service	Albany
Lynn & Haner	Alice
Chambers County Airport	Anahuac
Haile Flying Service	Austin
Jefferson County	Beaumont-Port Arthur
Travland Airport	Beeville
Reed's Air Service No. 2	Belton
Breckenridge Flying Service	Breckenridge
Frontier Airmotive, Inc.	Brownsville
City of Brownwood	Brownwood
City of Coleman	Coleman
A. & M. College of Texas	College Station
Conroe Aircraft Sales & Service	Conroe
City of Corpus Christi	Corpus Christi
Glasson Flying Service	Corpus Christi
Carey Mize	Crockett
F. H. Jackson	Cypress
Southwest Airmotive Company	Dallas
Glen Lakes Aviation Company	Dallas
North Texas Aviation Company	Denton
Hall Flying Service	Eagle Pass
Hefner Airport	El Campo
Falcon Aviation School	Falfurrias
Pecos County Airways	Fort Stockton
City of Fort Worth	Fort Worth
A. C. Flying Service	Galveston
Garwood Aviation	Garwood
Emmett Flying Service	Genoa
John A. Jackson	Goldthwaite
Graham Aviation Service	Graham
Greenville Majors Aviation	Greenville
Cliff Hyde Flying Service	Houston
Sky Travel, Inc.	Houston
Kerrville Flying Service	Junction
Kerrville Flying Service	Kerrville
Moyer Flying Service	Killeen
Frank Hogg Airport	Lamesa
Liberty Air Activity	Liberty
Lufkin Flying Service	Lufkin
Rogers Air Service	Marlin
Smith Aviation Company	Mercedes
Mexia Flying Service, Inc.	Mexia
Wisener School of Aeronautics	Mineola
Hopson-Putz Air Service	Mission
City of Monahans	Monahans
Faust Field	New Braunfels
Mayhew Aerial Service	Olney
Brownair, Inc.	Orange
Brockman Aero Service	Pearland
Jefferson County	Port Arthur-Beaumont
Bob Tanner Aviation Services & Supplies	Port Lavaca
Gorman Fox	Raymondville
Fancher Air Service	Refugio
Lane Airpark	Rosenberg
Saginaw Airport	Saginaw (Ft. Worth)
Davis Airport	San Antonio
Monroe & Witt Flying Service	San Antonio
Schneider Flying Service	Seguin
Smithville Flying Service	Smithville
Jones & Ogden	Stowell (Winnie)
W. J. Worsham	Taft
The Taylor School of Aeronautics	Taylor
Reed's Air Service	Temple
Matthew Wallace	Terrell
Gulf Coast Airport	Texas City
Carter Flying Service	Velasco (Freeport)
Zim-Tim Sky Ranch	Victoria
Wharton Flying Service	Wharton
Stoddard Aero Service	Wink

BENDIX-SCINTILLA LOW TENSION IGNITION SYSTEM

Airlines never compromise with quality, performance or safety—This is reason enough why, more and more, they are converting their ignition systems from high tension to low tension. . . . Because of the redesign of voltage circuits and the location of ignition coils close to the spark plugs, electrode life is more than doubled and ignition interference with radio reception is greatly reduced.

BENDIX SCINTILLA

SCINTILLA MAGNETO DIVISION OF
SIDNEY, NEW YORK

Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, N. Y.

Bendix AVIATION CORPORATION

FACTORY BRANCH OFFICES:
117 E. Providencia Avenue, Burbank, California • 23235 Woodward Avenue, Ferndale, Michigan • 7829 W. Greenfield Avenue, West Allis 14, Wisconsin.

TION

nsin.